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VERIFICATION IN ALL ITS ASPECTS, INCLUDING THE ROLE OF THE UNITED NATIONS IN THE FIELD OF VERIFICATION

Report of the Secretary-General

1. The General Assembly, in its resolution 48/68 of 16 December 1993, requested the Secretary-General, as a further follow-up to the study on the role of the United Nations in the field of verification and in view of significant developments in international relations since that study, to undertake, with the assistance of a group of qualified governmental experts, an in-depth study on verification in all its aspects, including the role of the United Nations in the field of verification, and to report thereon to the Assembly at its fiftieth session.

2. Pursuant to that resolution, the Secretary-General has the honour to submit to the General Assembly the study on verification in all its aspects, including the role of the United Nations in the field of verification (see annex).

ANNEX

Study on verification in all its aspects, including the role of the United Nations in the field of verification

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ABBREVIATIONS

Acronyms and abbreviations used in the text

ABACC	Argentinian-Brazilian Agency for Accounting and Control of Nuclear Materials
ACRS	Arms Control and Regional Security Working Group
ASEAN	Association of South-East Asian Nations
BDA	Bilateral Destruction and Non-production Agreement
CIS	Commonwealth of Independent States
CPC	Conflict Prevention Centre (OSCE)
CSCE	Conference on Security and Cooperation in Europe*
CTR	Cooperative Threat Reduction
EU	European Union
ECCAS	Economic Community of Central African States
IAEA	International Atomic Energy Agency
ICBM	Inter-continental ballistic missile
ISTC	International Science and Technology Centre
MFO	Multinational Forces and Observers
MIRV	Multiple independently targetable re-entry vehicle
NACC	North Atlantic Cooperation Council
NATO	North Atlantic Treaty Organization
NTM	National technical means
OAS	Organization of American States
OPCW	Organization for the Prohibition of Chemical Weapons
OSCE	Organization for Security and Cooperation in Europe

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* As of 1 January 1995, known as the Organization for Security and Cooperation in Europe (OSCE).

PTS	Provisional Technical Secretariat (OPCW)
SITCEN	United Nations Situation Centre
UNIDIR	United Nations Institute for Disarmament Research
UNSCOM	United Nations Special Commission
VEREX	Ad Hoc Group of Governmental Experts to Identify and Examine Potential Verification Measures from a Scientific and Technical Standpoint (Biological Weapons Convention)
VICS	Verification Implementation and Coordination Staff (NATO)
WEU	Western European Union

GLOSSARY

Full name of agreements mentioned in the text

Anti-Ballistic Missile Treaty	Treaty between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems
Biological Weapons Convention	Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction
CF Treaty	Treaty on Conventional Armed Forces in Europe
Chemical Weapons Convention	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction
Convention on Certain Conventional Weapons (Inhumane Weapons Convention)	Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to be Excessively Injurious or to Have Indiscriminate Effects
ENMOD Convention	Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques
INF Treaty	Treaty between the United States of America and the Union of Soviet Socialist Republics on the Elimination of Their Intermediate-Range and Shorter-Range Missiles
Non-Proliferation Treaty	Treaty on the Non-Proliferation of Nuclear Weapons
Partial Test Ban Treaty	Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and under Water
Sea-Bed Treaty	Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and the Subsoil Thereof
START I	Treaty between the United States of America and the Union of Soviet Socialist Republics on Reduction and Limitation of Strategic Offensive Arms
START II	Treaty between the United States of America and the Russian Federation on Further Reduction and Limitation of Strategic Offensive Arms
Treaty of Rarotonga	South Pacific Nuclear-Free Zone Treaty
Treaty of Tlatelolco	Treaty for the Prohibition of Nuclear Weapons in Latin American and the Caribbean

FOREWORD BY THE SECRETARY-GENERAL

Verification provisions have been a necessary element of substantive agreements from time immemorial, and one of the most difficult elements to negotiate. This requirement for verification was reflected in the first of the 16 principles of verification adopted by the General Assembly in 1988, which reads as follows, "Adequate and effective verification is an essential element of all arms limitation and disarmament agreements". 1/ In that light I very much welcome this report of the Group of Qualified Governmental Experts on their recently completed, and unanimously approved study, "Verification in all its aspects, including the role of the United Nations in the field of verification".

The present study properly builds on and further develops the recommendations of the 1990 study on "The role of the United Nations in the field of verification". The report on that study was welcomed, and commended to Member States, when the General Assembly adopted, by consensus, its resolution 45/65 of 4 December 1990. However, the 1990 study had been conceived in 1988 when the effects of the cold war were still very much in evidence. Since then, conditions have changed dramatically, and the United Nations has been entrusted with a wider range of activities in the fields of disarmament, confidence-building and conflict management, all activities where verification can play a key role. This situational change is not only of a political nature; new technologies are contributing to more effective means of verification as well.

Recognizing these changed circumstances, the General Assembly, by its resolution 48/68 of 16 December 1993, invited me to undertake, again with the assistance of a group of qualified governmental experts, an in-depth study to review the conclusions of the 1990 study, to examine the lessons of recent United Nations verification experience and other relevant international developments and to explore the further development of guidelines and principles for the involvement of the United Nations in verification. The Group adopted a definition of verification which broadened the "agreement-specific" approach from the 1990 study to include any commitment undertaken by a party or parties which they would then seek to have verified. This, in fact, is very much in line with my flexible approach to respond to the requirements of Member States in the field of international peace and security.

The major recommendations of the report, aside from those related to the further development of guidelines and principles, include specific, practical steps that might be undertaken by the United Nations, often in concert with Member States, and where appropriately authorized to do so. The recommendations on possible roles for the United Nations are organized in three broad categories:

- Facilitating and coordinating roles between existing verification procedures and implementing bodies;
- Common services roles, including provision of databases, information collection and analysis, and training;

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- Operational roles where neutral, third-party assistance might help in the implementation of global, regional, subregional and local agreements.

I fully agree with the concluding observation in the report that "modest steps, within the budgetary and political constraints currently facing the Organization, to enhance its verification role will have a positive impact on efforts by the international community to successfully implement disarmament treaties, to develop effective early-warning mechanisms for impending conflicts and to respond with appropriate strategies to manage and resolve conflicts that have occurred". This broadening of the concept of verification to include provision for both conflict prevention and post-conflict peace-building, while preserving its application to treaty-specific situations, reflects what I believe to be the views of Member States as we stand on the threshold of the twenty-first century.

I wish to express my sincere appreciation to the Chairperson and the members of the Group of Experts for their work in preparing the present report. I commend it to the General Assembly and urge that it be given full consideration.

Boutros BOUTROS-GHALI
Secretary-General
United Nations

Notes

1/ See Official Records of the General Assembly, Fifteenth Special Session, Supplement No. 3 (A/S-15/3), para. 60).

LETTER OF TRANSMITTAL

28 July 1995

Sir,

I have the honour to submit herewith the report of the Group of Governmental Experts on Verification in All its Aspects, including the Role of the United Nations in the Field of Verification, which was appointed by you in pursuance of General Assembly resolution 48/68 of 16 December 1993.

The Governmental Experts appointed by you were the following:

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Permanent Mission of Mexico
to International Organizations
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Ms. Suchitra Durai (first session)
Under-Secretary
Disarmament and International
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Mr. Ferenc Gajda
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Permanent Mission of Hungary
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Brigadier-General (Ret.) Henny J. van der Graaf
Eindhoven University of Technology
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Eindhoven, The Netherlands

Mr. Alaa Issa (fourth session)
Second Secretary
Permanent Mission of Egypt to the United Nations
New York

His Excellency
Mr. Boutros Boutros-Ghali
Secretary-General of the United Nations
New York

Mrs. Flora I. Karugu (first and second sessions)
First Secretary
Permanent Mission of Kenya
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Mr. Dmitri G. Youdin
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The present report was prepared between February 1994 and July 1995, during which period the Group held four sessions in New York: the first, from 22 to 25 February 1994; the second, from 11 July to 22 July 1994; the third, from 30 January to 10 February 1995; and the fourth, from 17 to 28 July 1995. In carrying out its work, the Group had before it publications and papers on various issues of relevance to the report that were circulated by members of the Group. In addition, the Group wishes to express its appreciation for numerous contributions, including oral presentations, which it received from different United Nations institutions, as well as from organizations outside the United Nations framework. A complete list is attached to the present study. The Group also wishes to express its gratitude to the International Atomic Energy Agency

(IAEA), particularly to Mr. Berhan Andemicael, who acted as an expert observer to the Group.

The members of the Group of Experts wish to express their gratitude for the assistance that they received from members of the Secretariat of the United Nations. They wish in particular to thank Mr. Prvoslav Davinic, Director, Centre for Disarmament Affairs, Ms. Olga Sukovic, who served as Secretary of the Group, Mr. Douglas Fraser, who served as Deputy Secretary of the Group, and Ms. Eiko Ikegaya and Ms. Sarah Meek, who conducted research and assisted in drafting. The Group expresses its special gratitude to Dr. Patricia McFate, who served in her private capacity as consultant to the Secretariat.

I have been requested by the Group of Governmental Experts, as its Chairperson, to submit to you, on its behalf, this report which was unanimously approved.

(Signed) Peggy MASON
Chairperson of the
Group of Governmental Experts
on Verification in All Its
Aspects, including the Role of the
United Nations in the Field of Verification

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I. INTRODUCTION

1. The General Assembly, in its resolution 43/81 B of 7 December 1988, reiterated its view that disarmament and arms limitation agreements should provide for the participation of parties directly or through the United Nations organs in the verification process and stated that it was conscious of the fact that the United Nations was already playing a useful role in the field of verification. The Assembly endorsed a set of 16 principles of verification developed by the United Nations Disarmament Commission. The 16 principles resulted partly from the three relevant paragraphs of the Final Document of the Tenth Special Session of the General Assembly, the first special session devoted to disarmament, which were used as a basis for the work of the Commission. 1/ In the same resolution the Assembly also recognized that the United Nations, in accordance with its roles and responsibilities under the Charter of the United Nations, could make a significant contribution in the field of verification, in particular of multilateral agreements. It requested the Secretary-General to undertake, with the assistance of a group of qualified governmental experts, an in-depth study of the role of the United Nations in the field of verification that would: (a) identify and review existing activities of the United Nations in the field of verification of arms limitation and disarmament; (b) assess the need for improvements in existing activities as well as explore and identify possible additional activities, taking into account organizational, technical, operational, legal and financial aspects; and (c) provide specific recommendations for future action by the United Nations in that context. The Secretary-General was further requested to submit a comprehensive report on the subject to the General Assembly at its forty-fifth session.

2. In accordance with its mandate, on 13 July 1990 the Group of Experts submitted its report to the Secretary-General, who in turn submitted it to the General Assembly on 28 August. 2/ The 1990 study suggested, inter alia, that an enhanced United Nations capability to assist in verification, with the consent of all States parties to disarmament agreements, could be a significant contribution to international security and cooperation and to that end made three specific recommendations for action by the United Nations: (a) the development by the Department for Disarmament Affairs of a consolidated data bank on all aspects of verification and compliance from the provision of published materials and data by Member States on a voluntary basis; (b) the promotion of exchanges between experts and diplomats; and (c) the possible strengthening and broadening of the scope of the role of the Secretary-General in fact-finding and other activities.

3. The 1990 study also considered the issue of an international verification system. It concluded that the development of a United Nations verification organization should be seen as an evolutionary process and would depend in large measure on further changes in the political environment and on the verification requirements emerging from continued advances in arms limitation and disarmament agreements. In the meantime, the United Nations would need to address the multilateral aspects of verification with increasing attention, in the light of the growing importance of multilateral negotiations.

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4. At its forty-fifth session, in 1990, the General Assembly adopted resolution 45/65 of 4 December in which it welcomed the 1990 study, commended it to the attention of Member States and requested that the Secretary-General take appropriate action on the Expert Group's recommendations with appropriate assistance from Member States.

5. By way of follow-up to the 1990 study and in view of significant developments in international relations since its completion, a draft resolution was introduced at the forty-seventh session of the General Assembly seeking the views of Member States on: (a) additional actions that might be taken to implement the recommendations contained in the study; (b) how the verification of arms limitation and disarmament agreements could facilitate United Nations activities with respect to preventive diplomacy, peacemaking, peace-keeping and post-conflict peace-building; and (c) additional actions that might be taken with respect to the role of the United Nations in the field of verification, including further studies by the United Nations on the subject. The draft was adopted by the Assembly as resolution 47/45 on 9 December 1992.

6. At its forty-eighth session, the General Assembly had before it a draft resolution entitled "Verification in all its aspects, including the role of the United Nations in the field of verification", which was adopted as resolution 48/68 on 16 December 1993. 3/

7. In the resolution the General Assembly noted that recent developments in international relations continued to underscore the importance of effective verification of existing and future agreements to limit or eliminate arms and that some of those developments had significant effects on the role of the United Nations in the field of verification, which required careful and ongoing examination. Recalling its resolution 47/45 and taking note of the report of the Secretary-General (A/48/227 and Add.1 and 2 containing the views of Member States on follow-up to the 1990 study, the Assembly requested the Secretary-General, as a further follow-up to the study, to undertake, with the assistance of a group of qualified governmental experts, an in-depth study that would: (a) examine the lessons from recent United Nations verification experiences, as well as other relevant international developments, for future activities by the United Nations and by the Conference on Disarmament in the field of verification in all its aspects, taking into consideration its specific experience, and with particular attention to the ways verification could facilitate United Nations activities with respect to confidence-building and conflict management and disarmament; (b) explore the further development of guidelines and principles for the involvement of the United Nations in verification; and (c) review the conclusions of the 1990 study group with particular attention to the ways that the United Nations might facilitate verification through relevant procedures, processes and bodies for acquiring, integrating and analysing verification information from a variety of sources. The Secretary-General was further requested to submit a report on the subject to the General Assembly at its fiftieth session.

8. The present report has been prepared pursuant to General Assembly resolution 48/68.

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II. EVOLUTION OF THE CONCEPT OF VERIFICATION

9. Since 1990, the international security environment has undergone - and continues to experience - a series of profound changes, including the end of the cold war. No longer stymied by ideological divisions between East and West, the new international environment provides the opportunity for a more dynamic multilateralism at both the global and regional levels.

10. At the same time, this period of rapid transition has seen a marked augmentation in regional conflicts, especially conflicts within States, and increased recourse to the United Nations for assistance. There are currently 16 United Nations peace-keeping operations under way, 11 of which were begun after 1990. Not only has the number of peace-keeping missions increased dramatically, but in relation to such tasks as humanitarian aid, election and human rights monitoring and the repatriation of refugees, their scope and complexity have broadened considerably.

11. During this period international awareness has reinforced the need to prevent proliferation, in all its aspects, of weapons of mass destruction and their delivery systems and to avoid excessive and destabilizing accumulations and transfers of conventional arms, including light weapons.

12. The number and scope of major multilateral arms limitation and confidence-building agreements which have been completed in the period between 1990 and 1995, together with other relevant compliance monitoring activities, have provided an unprecedented level of practical experience in the implementation of verification provisions which, in turn, has influenced how the concept as well as the process of verification are understood in today's world. In particular, verification is now seen to apply in a broader range of contexts than was hitherto the case.

13. In the 1990 study, verification is defined as a process which establishes whether the States parties are complying with their obligations under an agreement (A/45/372, para. 12). The process includes: collection of information relevant to obligations under arms limitation and disarmament agreements; analysis of the information; and reaching a judgement as to whether the specific terms of an agreement are being met. The context in which verification takes place is that of the sovereign right of States to conclude arms limitation and disarmament agreements and their obligation to implement such agreements. Verification is conducted by the parties to an agreement, or by an organization at their request. Although the mandate of the 1990 study did not extend to an examination of verification per se in contexts such as the implementation of confidence-building measures or monitoring activities in relation to a peace-keeping operation, it did however permit consideration of approaches, methods, procedures and techniques relating to other arrangements in the area of international peace and security which might be useful to the process of verification of arms limitation and disarmament agreements. Among the related activities identified by the study were agreed verification procedures in the context of crisis prevention and resolution as well as verification provisions for disengagement agreements in the context of United Nations or other multilateral efforts.

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14. In 1993, the broader context in which verification currently operated, as well as the increasing importance of compliance, was the subject of General Assembly resolution 48/63 of 16 December 1993, adopted by consensus, in which the Assembly welcomed the universal recognition of the critical importance of verification of arms limitation and disarmament agreements and other obligations. It is precisely this broader context, encompassing both the verification of arms limitation and disarmament agreements and other obligations, which the Assembly in its resolution 48/68 directed the 1995 Group of Governmental Experts to explore in the light of the new political environment and recent United Nations and other relevant international experiences.

15. From this new perspective, verification can be generically defined as a process in which data are collected, collated and analysed in order to make an informed judgement as to whether a party is complying with its obligations. Such obligations may derive from many sources, among the most important of which are multilateral treaties and/or agreements (including the Charter of the United Nations itself), bilateral treaties and/or agreements, decisions of competent multilateral organs (including the General Assembly and the Security Council) and/or unilateral commitments undertaken by a party or parties which they then seek to have verified.

16. This new definition combines both traditional verification in the context of arms limitation and disarmament agreements, which is carried out by the States parties or international organizations, composed of, or requested by, those parties, and a more recent approach to verification, which expands the sources of obligations beyond arms limitation and disarmament, inter alia, in the context of United Nations activities. There are differences and similarities, in nature and context.

17. This new definition not only embraces new sources of obligations to be verified but also expands its application to the types of obligations beyond limitations on armaments and military forces per se. It is now well accepted that the verification of confidence-building measures may well be beneficial in appropriate circumstances. Similarly, the process of monitoring compliance with measures under Article 41 of the Charter not involving the use of armed forces, commonly known as sanctions, is an increasingly relevant type of verification activity. This definition also takes account of the fact that the subjects of the obligations to be verified may include non-State actors involved in intra-State conflict.

18. The primary aim of verification is to increase the level of transparency in relation to relevant activities to a point where a determination regarding compliance can be reliably made. Confidence-building measures seek to reduce misperceptions and misunderstandings, as a first step towards replacing suspicion with confidence, by enabling the parties to be more transparent about their intentions in specific circumstances. In crisis situations or in post-conflict contexts, the ability of all parties to have accurate, timely information so that threatening actions can be avoided, or early warning of impending danger, may be central to the successful resolution of the dispute in question.

19. The methods by which data are acquired for verification purposes can be categorized as cooperative or unilateral. Cooperative measures are those in which the party being verified, as part of the agreed methodology, assists the verifier in order to facilitate the verification process. Examples include data exchanges, notifications and on-site inspections. Unilateral methods, such as the use of national technical means, require no such assistance by the party being verified.

20. The environment in which the verification process is taking place can be characterized as cooperative or non-cooperative. A cooperative verification environment may facilitate increased transparency which in turn promotes a harmonious data-collection process, and hence compliance will be more easily confirmed. Clarification of anomalous or ambiguous events may be facilitated by voluntary actions to demonstrate compliance that goes beyond the strict terms of a party's obligations. Non-compliance, if it occurs, may be the result of honest mistakes or misdirected actions, rather than a deliberate intention to be non-compliant. In a non-cooperative verification environment - for example where the verification is taking place in the context of a cease-fire agreement after a protracted period of hostilities - there is understandably less willingness to be transparent. In addition, there may be resort to patterns of behaviour which hamper collection of data or there may be deliberate efforts to conceal relevant events or activities. In such contexts anomalies may be, or may signal, acts of non-compliance and more extensive, and intrusive, investigative measures may be needed to determine if a party is engaged in non-compliant activities. Whatever the political environment in which the verification is taking place, ambiguities need to be resolved to the satisfaction of all parties.

21. Like confidence-building, the verification process is a fluid one which both influences and is influenced by the broader political context. As a culture of transparency and mutually beneficial interactions replaces one of secrecy and suspicion, the verification environment may change from one where the inspected party actively seeks to evade inspection to one where that party is "passive", seeking neither to hinder nor to help, to an atmosphere of active cooperation between inspected and inspecting parties because both see a shared interest in demonstrating compliance.

III. REVIEW OF THE CONCLUSIONS OF THE 1990 STUDY GROUP

A. Background

22. In following up the 1990 study on the role of the United Nations in the field of verification, the new Experts Group was mandated to "review the conclusions of the 1990 study group with particular attention to the ways that the United Nations might facilitate verification through relevant procedures, processes and bodies for acquiring, integrating and analysing verification information from a variety of sources". 4/

23. In its report, the 1990 Group of Experts concluded (A/45/372, chap. VI) that a more peaceful international system should have, as one of its main pillars, arms limitation and disarmament agreements with effective verification

measures in which all States could have confidence. The Group noted that the unique strengths of the United Nations - its global scope, its membership, and its Charter - made it well suited to undertake certain activities with respect to verification. In assessing the need of United Nations involvement in the verification of arms limitation and disarmament agreements, the 1990 study took as its point of departure the universal recognition that States had equal rights to participate in the process of international verification of agreements to which they were parties. The study noted the asymmetries in capabilities of States in the field of verification and the need to look for multilateral ways and means of coordinating resources in order to ensure their most efficient use.

24. The 1990 Group of Experts offered its conclusions and recommendations in six areas:

(a) Data-collection capability;

(b) Exchange between experts and diplomats;

(c) Role of the Secretary-General in fact-finding and other activities;

(d) Use of aircraft for verification purposes;

(e) Use of satellites;

(f) Towards an international verification system.

25. In this chapter, the recommendations and conclusions of the 1990 study will be briefly summarized and the current status of their implementation reviewed. An analysis of new developments and future possibilities may be found in chapter VI of the present report.

B. Data-collection capability

26. The 1990 Experts Group agreed (ibid., paras. 262-266) that the United Nations could play a useful role in making research and data relating to verification available to wider audiences. Increasingly, access to data and its availability have become essential building blocks for arms limitation and disarmament agreements and for confidence- and security-building measures between States. The United Nations could take an active role in facilitating the operational international exchange of these data. Most of the data would be provided voluntarily by States and the data bank would be accessible by other States; it would be computer-based and would have facilities for storage and retrieval, on-line access and the capacity to interface with other relevant data banks to which Member States provide access.

27. In implementing the conclusions and recommendations of the 1990 study, the United Nations Centre for Disarmament Affairs has gradually acquired the capacity to store and retrieve electronic data. A small number of States have made specific contributions to the database in both hard copy and electronic form. 5/ The Centre also assists in data collection through its role in consolidating returns from States parties and Member States related to a number

of confidence-building measures, for example, information submitted on laboratories and other facilities by States parties to the Biological Weapons Convention. 6/ Among other data, the Centre maintains lists of experts for specific tasks such as the investigation of the alleged use of chemical and biological weapons, as well as other fact-finding and advisory missions mandated by the Secretary-General in response to requests from Member States.

28. The bulk of the information collected to date is bibliographical and needs additional input from Member States. The Centre for Disarmament Affairs is developing procedures for inputting more operational data to assist it in its day-to-day work, including responses to requests for information from permanent missions to the United Nations. Advances are being made in making data electronically accessible and usable by staff of the Centre and other parts of the Secretariat. Provision of data bank access for Member States - a key objective of the 1990 report - remains a goal which the United Nations will be unable to meet until it is able to address satisfactorily issues of cost, systems compatibility and security of confidential information within the various data management systems of the Organization.

29. Other data collected by the United Nations in relation to confidence-building include the collection of information submitted by Member States in response to General Assembly resolutions establishing the standardized instrument for the international reporting of military expenditures, and the Register of Conventional Arms. 7/ Data in respect of both mechanisms is provided to Member States in the form of consolidated annual reports of the Secretary-General and, in the case of the Register, much of it is also stored electronically.

30. The 1990 study identified the standardized reporting of military budgets to the United Nations as potentially useful in promoting openness of information about military spending and comparability of budgets. However, Member States continue to hold differing views on the appropriate method of reporting and the participation rate is limited. In contrast, the Register of Conventional Arms, established on 1 January 1992, has attracted greater support. Member States are called upon to provide annually to the Secretary-General relevant data on imports and exports of arms in seven categories of conventional weapons. In addition, pending the expansion of the Register, Member States are invited to provide to the Secretary-General, with their annual report on exports and imports, available background information regarding their military holdings, procurement through national production and relevant policies.

31. The Register is intended to be global in nature and voluntary in character. Its aim is to promote an increased level of transparency in armaments in order to enhance confidence, promote stability, help States to exercise restraint, ease tensions and strengthen regional and international peace and security. While there are no verification provisions, the reporting by Member States of both exports and imports allows some comparisons to be made.

32. The Register became fully operational in 1993, with a total of 92 States submitting data on international transfers of conventional arms for calendar year 1992. In addition, 34 States submitted background information, including listings of military holdings from 22 States and data on procurement through

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national production from 14 States. It has been estimated that more than 90 per cent of actual transfers were thus reported. 8/

33. Pursuant to General Assembly resolution 48/75 E of 16 December 1993, the Secretary-General appointed a Group of Governmental Experts to assist him in the preparation of a report on the continuing operation of the Register and its further development. The Group held three sessions in 1994 during which it considered three dimensions: (a) adjustments to the definitions for the seven existing categories of equipment; (b) the addition of new categories of conventional weapons; and (c) the early expansion of the scope of the Register as called for in General Assembly resolution 46/36 L of 9 December 1991. The Group could not reach consensus in respect of these matters but concluded that they should be kept under review in future (see A/49/316).

34. In his 1993 and 1994 annual reports on the work of the Organization, the Secretary-General reiterated that the Register was an important element in international efforts to enhance trust and confidence among States and that its value could be increased even further if, in addition to providing transparency in the international arms trade, its scope were expanded to include data on military holdings and procurement through national production. 10/ He also strongly urged Member States to make use of the Register, together with other confidence-building measures, particularly within regional and subregional frameworks, with a view to contributing to the United Nations efforts in the fields of preventive diplomacy and peacemaking. 11/

C. Exchanges between experts and diplomats; research activities

35. The 1990 Group of Experts recognized that, in the short term, in anticipation of further advances in the field of treaty-specific verification and new agreements increasing confidence and transparency between States, the United Nations could play a constructive role in promoting exchanges between experts and diplomats to help the latter to address negotiating problems and to help experts focus on needed solutions. The exchanges could also promote international cooperation in the development of verification procedures. Accordingly, the Group recommended that the United Nations, through the Department (now Centre) for Disarmament Affairs, should promote workshops, seminars and training programmes on verification and compliance, and that the United Nations Institute for Disarmament Research should increase its research activities on verification topics. The Group further recommended that the United Nations explore ways to provide expert advice to States, at their request, to establish and implement verification structures, thereby increasing their effective participation in agreements (A/45/372, paras. 267-270).

36. Since the publication of the 1990 study, the Centre for Disarmament Affairs has organized a number of seminars and conferences at which the question of verification and monitoring in the context of disarmament has been addressed. 12/ A number of other seminars, symposia and conferences have focused on confidence-building measures and transparency. Such conferences and workshops have been regularly organized by the Centre for Disarmament Affairs, often in cooperation with one of the three United Nations regional centres for peace and disarmament. 13/

37. Verification has been a regular feature of the UNIDIR research programme for several years. With a particular focus on verification procedures contained in agreements and treaties currently in force or under negotiation as well as on relevant international organizations in the field of verification, monographs have been prepared, inter alia, on national concepts of verification, 14/ a systematic classification of methods and practices of verification and an analytical study of the procedures envisaged by each treaty and their implementation; 15/ and on the impact of ongoing and foreseeable technological developments for verification purposes. 16/

38. Currently, UNIDIR is carrying out two projects in monitoring and verification, the first related to the role of high technology and the second to that of international organizations. The project on high-technology ground-to-space tracking will produce a technical assessment of these systems as well as an examination of their utility in the development of a confidence-building regime for outer space. The second will examine prospects and proposals for the enhancement of the functions of international organizations in the field of verification and monitoring. A project is also to be implemented to evaluate the experience of the United Nations Special Commission (UNSCOM) in Iraq and in order to identify potential benefits for verification processes.

39. In his 1994 report to the General Assembly (A/49/329), the Director of UNIDIR explained the rationale behind a major study currently under way on the utility and modalities of disarming warring parties as an element in efforts to resolve intra-State conflict, the type of conflict recognized as likely to be the most prevalent and destabilizing in the near future. The study focuses on a systematic examination of the disarmament dimension of United Nations conflict management processes. Because parties to a conflict, especially intra-State conflict, have little or no confidence in each other, verification and transparency take on special importance. The role of the United Nations, as a neutral "third party" 17/ able to facilitate the twin objectives of disarmament and peace-building, is central to the UNIDIR study.

D. Role of the Secretary-General in fact-finding and other activities

40. The 1990 Group of Experts believed that the Secretary-General's fact-finding experience could be helpful with respect to those arms limitation and disarmament agreements lacking explicit verification provisions. Building on his current mandate to investigate the alleged use of chemical and bacteriological methods of warfare contrary to the 1925 Geneva Protocol, the Group agreed that, in the short term, the Secretary-General's fact-finding capabilities could be strengthened by broadening the scope of his mandate or by expanding the means through which his existing mandate was carried out. However, the 1990 Group noted that care must be taken so as not to hinder his flexibility to conduct fact-finding missions in a manner most appropriate to the circumstances. In particular, the Group agreed that the Secretary-General's fact-finding mandate could be extended to cover the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects (the Inhumane Weapons Convention).

41. In addition, in order to further strengthen the complementary role played by bilateral and multilateral disarmament and arms limitation efforts, the 1990 Group recommended that States parties to future multilateral arms limitation and disarmament agreements consider depositing those instruments with the Secretary-General of the United Nations, providing the United Nations with periodic reports regarding implementation of those agreements for subsequent dissemination to all Member States and seeking the assistance of the United Nations in the organization of review conferences (A/45/372, paras. 271-272).

42. Regarding the status of implementation of these recommendations, the Secretary-General has been made the sole depositary of the landmark Chemical Weapons Convention, 18/ a multilateral agreement now signed by 157 countries, and which was opened for signature on 13 January 1993. Since February 1993, the Provisional Technical Secretariat of the Organization for the Prohibition of Chemical Weapons (OPCW) has been engaged in preparations for the entry into force of the Convention. The Convention will enter into force after the deposit of the sixty-fifth instrument of ratification. 19/ The Executive Secretary of the Provisional Technical Secretariat has made annual reports to the First Committee of the General Assembly on its progress. In his capacity as depositary, and in the light of the concern of the international community as to the low number of ratifications of the Convention, 20/ the Secretary-General has written to the Governments of the 140 signatory States that have not yet ratified and urged them to do so in this fiftieth anniversary year of the United Nations. When the Convention enters into force, close cooperation between the United Nations and OPCW is expected, particularly in the light of the Secretary-General's continuing responsibility in relation to allegations of chemical weapons use by States non-party to the Convention.

43. Since the 1990 study, considerable steps have been taken to strengthen the Secretary-General's fact-finding capability in the field of the maintenance of international peace and security. The relevance of those efforts for United Nations verification activities in relation to confidence-building and conflict management is discussed in chapter IV below.

E. Use of aircraft for verification purposes

44. While the 1990 Experts Group did not make any specific recommendation with regard to the use of aircraft for verification purposes, it recognized its potential utility for both verification purposes and for the monitoring of confidence- and security-building measures. The Group noted that, while the use of aircraft by the United Nations for such purposes would have significant organizational and financial implications, those costs could be reduced by donations from Member States for United Nations use of specialized aircraft with appropriate sensors.

45. Although the use of aircraft for observation missions has a long history, the recent use of aerial surveillance in United Nations operations has demonstrated the utility of such methods for verification and monitoring purposes. In the case of UNSCOM, high-altitude aerial imagery was obtained from reconnaissance flights of a dedicated U-2 aircraft of the United States of America. The U-2 is reportedly the first reconnaissance system to be placed

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under full-time United Nations control. In addition, helicopter aerial imagery was obtained by UNSCOM using CH-53 helicopters provided by Germany. In the former Yugoslavia, the United Nations Protection Force (UNPROFOR), under Security Council authorization, has requested a regional organization, the North Atlantic Treaty Organization (NATO), to carry out aerial surveillance on its behalf (ibid., para. 273).

F. Use of satellites

46. Although no recommendations were made in this area, the 1990 Group of Experts recognized (ibid., para. 374) that satellites had played a key role in verifying arms limitation and disarmament agreements and predicted that they would continue to do so in the future. The Group also noted that developing a United Nations satellite network for arms control verification would have major organizational and financial implications.

47. In the absence of an international satellite monitoring agency, the 1990 Group suggested that Member States operating observation satellites could undertake to provide their services, including possible access to their imagery. The use, since 1990, in multilateral contexts of both commercial and national technical means as part of monitoring efforts underscores the relevance of an enhanced role for satellite imagery for verification and monitoring purposes. 21/ This issue is discussed in detail in subsequent chapters of the present report.

G. Towards an international verification system

48. While the political climate at the time of the 1990 study was not conducive to recommendations concerning the development of a "United Nations verification system" and the 1990 Experts Group did not pass definitive judgement on the issue, it did note that such a development was dependent on further changes in the political environment and on the verification requirements emerging from continued advances in arms control agreements. The Group affirmed that such development must be seen as an "evolutionary process", and identified several ways in which such an "international verification system" could come into existence including as an "umbrella" verification organization resulting from the coordination or merging of two or more future verification systems. The Group of Experts concluded that the development of a United Nations verification system should continue to be the subject of consideration as the international political environment changes (ibid., paras. 275-277).

49. With the current proliferation of multilateral verification mechanisms as a result of agreements already concluded or under discussion, the issue of an international verification system is receiving increasing attention. Throughout the remainder of the present report, the role that the United Nations might play, whether in facilitating verification under discrete mechanisms or in moving a modest step closer to an umbrella system, is explored in detail.

IV. RECENT UNITED NATIONS VERIFICATION EXPERIENCE AND OTHER RELEVANT INTERNATIONAL DEVELOPMENTS

A. Introduction

50. Because the scope and nature of verification tasks, aims and technologies, as well as the contexts in which verification operates have continued to evolve and expand, many lessons are emerging from recent ground-breaking United Nations verification activities and from other international developments associated with arms limitation and disarmament treaties, confidence-building measures and conflict management and resolution activities. In the present chapter that recent experience is examined in an effort to identify lessons, both old and new, of particular relevance to the role of the United Nations in verification.

B. Existing arms limitation and disarmament agreements and arrangements 22/

1. Nuclear weapons-related agreements and arrangements

(a) Non-proliferation commitments and implementation of safeguards

(i) Introduction

51. The Treaty on the Non-Proliferation of Nuclear Weapons, which entered into force in 1970, has 179 States parties as of 1 August 1995. Verification of compliance with the non-proliferation obligations of States parties is through the use of safeguards administered by the International Atomic Energy Agency, an autonomous agency of the United Nations family of organizations, with a membership of 122 States. Safeguards are designed to verify statements regarding the presence, amounts and use of nuclear material or other items subject to safeguards as recorded by facility operators and as reported by the State to IAEA. 23/ In addition to the Non-Proliferation Treaty, two other multilateral agreements require the acceptance of IAEA safeguards by the States parties: the Treaty for the Prohibition of Nuclear Weapons in Latin America (Treaty of Tlateloco) and the South Pacific Nuclear-Free Zone Treaty (Treaty of Rarotonga). The legal obligation to submit to Agency safeguards is also found in other legal instruments, including bilateral agreements between nuclear suppliers and recipients. The application of safeguards in accordance with all these obligations is conducted on the basis of specific safeguards agreements negotiated between the Agency and the individual State in accordance with the framework for the conclusion of such agreements between the Agency and Member States established by the Agency's statute and other relevant legal instruments. Article III of the statute authorizes the Agency, inter alia, "to establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available ... are not used in such a way as to further any military purpose".

52. IAEA uses nuclear material accounting to establish the quantities of nuclear material present in a State and the changes that take place in that inventory. Containment and surveillance measures, for example, the use of Agency seals, cameras and videotape recorders, are complementary measures which

take advantage of physical barriers, such as walls or containers, to restrict or control access to, or the movement of, nuclear material or equipment and to reduce the probability of undetected movement.

53. Under safeguards agreements pursuant to the Treaty, Agency inspectors conduct ad hoc and routine inspections in the course of which they carry out a number of functions, including examination of records, taking measurements, verification of the functioning and calibration of technical instruments and application of containment and surveillance measures. Under these agreements, the Agency may also conduct special inspections, inter alia, if it considers that information made available by the State "is not adequate for the Agency to fulfil the responsibilities under the agreement." 24/ As a result of revelations of a covert nuclear-weapons programme by a State party to the Treaty, in February 1992, the IAEA Board of Governors affirmed the Agency's right to conduct special inspections under its safeguards agreements with States parties to the Non-Proliferation Treaty. 25/

54. Safeguards-strengthening measures introduced by IAEA in the wake of the Gulf war include the early provision of information about the design of new nuclear plants and/or modifications to existing ones; more systematic collection and analysis of information available in the media and from other open-source literature about nuclear activities in a State; and the voluntary reporting by States, over and above the reporting requirements, of their imports and exports of nuclear material and of certain equipment and non-nuclear material used in the nuclear industry.

(ii) Safeguards and verification of nuclear-weapon dismantlement - South Africa

55. In September 1991, IAEA became engaged in activities to verify the completeness and to assess the correctness of South Africa's initial report on its nuclear material subject to safeguards, following the conclusion of a comprehensive Non-Proliferation Treaty-related Safeguards Agreement between South Africa and the Agency. In March 1993, a new dimension was added when the President of South Africa announced that his country had previously developed a limited nuclear deterrent capability which had been dismantled and destroyed before South Africa had acceded to the Treaty. At the invitation of the South African authorities, Agency experts visited the facilities involved in the abandoned nuclear-weapons programme and reviewed the associated historical data for the purpose of assessing the status of the programme and verifying that all the nuclear material used in the programme had been fully accounted for and placed under Agency safeguards.

56. That was the first occasion on which a State, which had covertly developed nuclear weapons and then dismantled them, subsequently invited IAEA to verify the fact of the discontinuance of its weapons programme and the dismantlement of the weapons. With full access to all relevant facilities, IAEA was able sufficiently to resolve initial discrepancies to enable it, at the end of 1993, to reach a conclusion giving a "high level of assurance" that South Africa's inventory of nuclear material and facilities was complete, that its former nuclear-weapons programme had been abandoned and that nuclear material involved in that programme had been placed under safeguards. 26/

(iii) Verification of compliance with safeguards obligations - Democratic People's Republic of Korea

57. Following the entry into force of the comprehensive Safeguards Agreement between the Agency and the Democratic People's Republic of Korea in April 1992, the Agency began the task of verifying the initial report of the Democratic People's Republic of Korea on nuclear material subject to safeguards in that country. The Agency concluded that, because of significant inconsistencies between information provided by the Democratic People's Republic of Korea and the IAEA secretariat's findings, the secretariat could not confirm the correctness and completeness of the report.

58. Following various efforts to resolve those inconsistencies, the IAEA Director General requested access to additional information and to sites in accordance with the special inspection provisions of the Safeguards Agreement of the Democratic People's Republic of Korea with the Agency. That action was supported by the IAEA Board of Governors in February 1993 and, in May 1993, by the United Nations Security Council, after the Director General had reported to it on the non-compliance of the Democratic People's Republic of Korea with its Safeguards Agreement, resulting in the Agency's inability to verify non-diversion.

59. Inspection of the seven declared facilities was eventually completed in mid-1994, although the problem of verifying the initial report of the Democratic People's Republic of Korea was further complicated by its discharge of spent fuel from the 5-megawatt experimental nuclear-power reactor without the appropriate safeguards measures requested by the Agency. 27/ In carrying out its verification activities in the Democratic People's Republic of Korea, IAEA was able to utilize new methods, technologies and analytical techniques, particularly environmental monitoring, 28/ which the Agency employed during inspections while seeking to ascertain the possibility of undeclared activities.

60. On 21 October 1994, the United States and the Democratic People's Republic of Korea signed an "Agreed Framework", consisting of a number of actions for overall resolution of the nuclear issue on the Korean peninsula. In the agreement the Democratic People's Republic of Korea committed itself, inter alia, to remaining a party to the Non-Proliferation Treaty, freezing its graphite-moderated reactors programme, and allowing a gradual process leading ultimately to full implementation of its IAEA Safeguards Agreement. The Agency maintains that the Safeguards Agreement remaining in force should be fully implemented.

(iv) Verification of multipartite safeguards arrangements - ABACC

61. In 1990, the Presidents of Argentina and Brazil signed a Declaration on Common Nuclear Policy at Foz do Iguaçu, Brazil. In the Declaration, they established, inter alia, a common system of accounting and control of nuclear material for the purpose of verifying that nuclear material in all nuclear activities of the parties was used exclusively for peaceful purposes. The 1991 Argentina-Brazil Agreement on the Exclusively Peaceful Uses of Nuclear Energy established the Argentinian-Brazilian Agency for Accounting and Control of Nuclear Materials (ABACC), which has been in operation since July 1992.

Negotiations with IAEA on a safeguards agreement to cover all nuclear materials within the territories or under the jurisdiction or control of the two countries was completed and a Safeguards Agreement was signed by the end of 1991.

62. The Quadripartite Safeguards Agreement between Argentina, Brazil, IAEA and ABACC entered into force on 4 March 1994, and the implementation of its provisions is under way. One of the obligations of the parties is to promote a cost-effective and complementary application of safeguards in accordance with a balanced application of three principles set out in the Agreement and its additional protocol: empowerment of ABACC and IAEA to reach independent conclusions; at the same time, avoidance of unnecessary duplication of safeguards; and implementation of safeguards in a manner designed to be consistent with prudent management practices required for the economic and safe conduct of nuclear activities.

(v) The strengthening of safeguards

63. In 1993 IAEA launched a major effort towards strengthening safeguards in order to enhance their ability to detect any undeclared nuclear activities in a State. In this context, and building upon earlier safeguards-strengthening measures endorsed by its Board of Governors, the Agency's Programme 93 + 2, with the support of IAEA member States, has been developing and field-testing further measures to strengthen safeguards. In general terms, such measures can be grouped into clusters related to more access for the Agency, both to information about a State's nuclear activities and to sites in order to verify the additional information that the Agency seeks to obtain. Increased access, whether to information or to sites, would flow from greater nuclear transparency on the part of States. The Agency continues to advocate the value of greater transparency about all aspects of a State's nuclear programme and to encourage States to exhibit such transparency.

64. At its meeting in March 1995, the Agency's Board of Governors, inter alia, recognized that States parties to comprehensive agreements and the Agency have an obligation to cooperate fully to facilitate the implementation of the safeguards provided for in the relevant agreements. The Board also endorsed the general direction of Programme 93 + 2 for a strengthened and cost-effective safeguards system. It noted that such a system would benefit from technological developments and would call for greater access to relevant information and greater physical access to relevant sites for the Agency, either on the basis of authority already provided for in comprehensive safeguards agreements or on the basis of complementary authority to be conferred by the States involved. At its meeting in June 1995, the Board of Governors took note of the Director General's plan to implement, at an early date, measures for which legal authority already existed. These relate to the clusters of measures on greater access to information, for example, through environmental monitoring, and to sites, for example, through some no-notice inspections at locations where the Agency currently has access for routine inspections and those measures to optimize the use of the present safeguards system. Measures that would require additional authority are to be considered by the Board of Governors in December 1995.

(b) Treaty on the Elimination of Intermediate-Range and Shorter-Range Missiles

65. The INF Treaty, which entered into force in 1988, required the United States and the then Soviet Union to eliminate all their intermediate-range ground-launched ballistic and cruise missiles and their launchers within three years of the Treaty's entry into force. Those obligations have been met. Verification of the Treaty continues, however, with a focus on ensuring that its provisions are being observed.

66. From the mid-1950s until the conclusion of the INF Treaty, verification of bilateral arms control agreements relied primarily on NTM. Building on the provisions of the Anti-Ballistic Missile Treaty, which required the parties to facilitate the use of NTM by prohibiting interference with, and deliberate concealment from, its use, the INF Treaty incorporates a range of cooperative and mutually reinforcing measures. These include extensive data exchanges concerning numbers, locations and technical characteristics of treaty-limited items; inspections at INF sites to confirm the data exchanged and to help monitor elimination of the weapons; short-notice on-site inspections at INF-related sites during the 3-year reduction period and the next 10 years; permanent on-site inspectors at a key missile production facility in each country; a prohibition on interference with verification by NTM; and cooperative measures for opening missile shelters. "Mock" inspections (unilateral trial inspections) played an important role in the implementation of the Treaty in a wide variety of areas, including the testing of plans, concepts, procedures and equipment, and the training of inspection and escort personnel. In addition, the Parties to the INF Treaty established a Special Verification Commission to resolve, inter alia, questions relating to compliance with the obligations assumed (article XIII of the INF Treaty).

67. Many decisions on the verification regime were made late in the process and there was a shortened planning period for implementation of the regime. Certain provisions required completion of several basic obligations within a short period after entry into force, necessitating some initial ad hoc arrangements. The initial INF data submitted by both sides required further review in order to ensure that they had been properly derived from operational systems and that specific agreed measurement scales had been used. INF missile elimination planning and scheduling also required post-negotiation consideration of significant factors outside the disarmament process per se, including federal, State and local environmental standards - factors not sufficiently considered during the negotiating process.

(c) The Strategic Arms Reduction Talks

68. The START treaties - START I, signed by the United States and the Soviet Union on 31 July 1991, and START II, signed by the Russian Federation and the United States on 3 January 1993 - require significant reductions in deployed strategic offensive arms, create a regime for counting, locating, basing and operating such arms and regulate the testing and modernization of those weapons. On 23 May 1992, the United States and Belarus, Kazakstan, the Russian Federation and Ukraine signed the Lisbon Protocol, 29/ on the basis of which Belarus, Kazakstan, the Russian Federation and Ukraine, which had strategic offensive arms of the former Soviet Union stationed on their territories, became parties

to START I as successors to the former USSR. On 5 December 1994, those countries and the United States exchanged instruments of ratification at Budapest, bringing the Treaty into force. START I implementation activities began even before entry into force (for example, exchanges of data on flight tests of missiles). Baseline inspections of the parties' strategic nuclear facilities began in March 1995.

69. START II, based on a Joint Understanding between the Presidents of the Russian Federation and the United States, reduces the total number of strategic nuclear weapons deployed by both countries by two thirds below pre-START I levels and provides for the elimination of all ICBMs carrying multiple independently targetable re-entry vehicles (MIRVed ICBMs). Because of the close relationship between the two treaties, it was agreed that START II should not enter into force before START I. The United States Senate Foreign Relations Committee resumed its hearings for START II ratification on 31 January 1995. The Foreign Affairs and the Defence Committees of the Russian State Duma presently have START II ratification as an item on their agendas.

70. The START treaties pose verification challenges which exceed those encountered in the INF verification experience. The INF Treaty required the permanent elimination of treaty-limited items - a requirement which simplified compliance monitoring - while the START agreements call for reductions and subsequent limitations of treaty-limited items. In addition to verifying specific numbers of treaty-limited items, the monitoring process must also be able to distinguish between deployed and non-deployed missiles, converted and accountable bombers, new and existing types of missiles and the like.

71. The START I verification regime, which is based upon and expanded from the INF regime, is designed to facilitate verification by NTM. It provides for data exchanges and notifications on strategic systems and facilities, exchanges of telemetry data from missile flight tests, a ban on the encryption of telemetry data, 12 types of on-site inspections and exhibitions and continuous monitoring at ICBM final assembly plants. This regime also applies to START II. In addition, the latter contains certain unique verification provisions which respond to the need to tailor the provisions to the differing obligations of the respective parties.

(d) Other bilateral agreements and arrangements

(i) Russian Federation - United States

72. Since July 1992, using an approach characterized by the parties as "cooperative denuclearization", over 30 bilateral agreements have been signed between the United States and the Russian Federation, Ukraine, Belarus and Kazakstan, some of them related to the Nunn-Lugar Act. 30/ The current objectives of the ongoing Cooperative Threat Reduction programme (CTR) include helping Belarus, Kazakstan and Ukraine to meet the provisions of the Lisbon Protocol, assisting the Russian Federation in strategic offensive arms reduction to START I goals by 2001 and enhancing the security of all Russian nuclear weapons. CTR programme activities have included support for warhead removal, ICBM deactivation, and silo eliminations in Ukraine and Kazakstan; emergency

response equipment in Belarus and Kazakstan; and installation of security and safety enhancements to Russian nuclear-weapon transport railcars.

73. The recently initiated Laboratory-to-Laboratory Nuclear Materials Protection, Control, and Accounting Program, provides opportunities for United States national laboratories and institutes in the Russian Federation to develop model control systems at selected facilities which will protect weapons-usable fissile material from theft or diversion. Similar cooperative programmes are being developed in Ukraine, Kazakstan, and Belarus. On 16 March 1994, the United States Department of Energy and the Ministry of Atomic Energy of the Russian Federation signed a joint statement of intent to host reciprocal inspections of facilities containing plutonium removed from nuclear weapons. Such on-site inspections will be taking place in highly sensitive military installations as well as in relation to equally vital commercial proprietary information.

74. The United States Nuclear Regulatory Commission is cooperating with Gosatomnadzor of the Russian Federation on the development of a safeguards infrastructure for the latter country. The International Science and Technology Center (ISTC), funded in part under the Nunn-Lugar Act, has supported over 90 projects to redirect the efforts of defence scientists and engineers, in the former Soviet Union. ISTC has supported a Gosatomnadzor-led project with the cooperation of the Russian Ministry of Atomic Energy to develop safeguards for plutonium processing at the Tomsk-7 plant. More than 5,000 former Soviet defence scientists have been part of CTR-supported civilian research projects funded by ISTC.

75. The United States and the Russian Federation have also exchanged information concerning unilateral measures which each has taken, and plan to take, in regard to reductions in their nuclear forces and improvements in safety, security, and control practices related to those forces. The United States has unilaterally declassified information regarding its plutonium production and storage. The two countries have agreed to conduct a joint exercise on early warning of missile launches and to exchange details of nuclear warhead production since 1945.

76. At the May 1995 Moscow Summit, the Presidents of the two countries declared that fissile materials removed from United States and Russian Federation nuclear weapons which were being eliminated and were in excess of national security requirements would not be used to manufacture nuclear weapons; no newly produced fissile materials would be used in nuclear weapons; and fissile materials from or within civil nuclear programmes would not be used to manufacture nuclear weapons. Additional bilateral agreements are being planned, including reciprocal monitoring at storage facilities of fissile materials removed from nuclear weapons to help confirm the irreversibility of the process of reducing those countries' nuclear weapons.

77. The increased access to nuclear production and nuclear warhead dismantlement facilities by the parties offers considerable opportunities for reassurance concerning the status of nuclear-weapons dismantlement, as well as the implementation of tightened accountability procedures for nuclear weapons and fissile materials. Enhanced transparency 31/ of activities provides the two

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countries with reassurances about their intentions, thereby reinforcing the commitment of each party to continued cooperation.

(ii) Democratic People's Republic of Korea and Republic of Korea; Democratic People's Republic of Korea and United States of America

78. In February 1992, the Republic of Korea and the Democratic People's Republic of Korea adopted the Agreement on Reconciliation, Non-aggression, and Exchanges and Cooperation (Basic Agreement) and the Joint Declaration of Denuclearization of the Korean Peninsula. Following those Agreements, the two Governments began to take concrete steps towards establishing a security dialogue.

79. The Joint Declaration prohibits not only the testing, manufacture, acceptance, possession and deployment of any nuclear weapons, but the possession of any nuclear reprocessing as well as enrichment facilities. In order to establish a verification system for the Declaration, the Republic of Korea and the Democratic People's Republic of Korea began negotiating on the inspection regime through a Joint Nuclear Control Committee. But both sides could not resolve their differences on the scope and extent of the inspection. Thus their efforts to establish an inspection regime have been deadlocked since December 1992.

80. The Basic Agreement is important in a military sense because it contains non-aggression clauses. Specifically, both sides agreed to set up a Joint Military Commission and to discuss steps to build military confidence and to achieve arms reduction, including the mutual notification of major movements of military units, and military exercises, the peaceful utilization of the demilitarized zone (DMZ), exchanges of military personnel and information, and phased reductions in armaments. Although the Republic of Korea and the Democratic People's Republic of Korea established the Joint Military Commission in May 1992 and tentatively adopted an auxiliary agreement for the detailed formula for South-North non-aggression, further progress has not been achieved owing to the aggravated political environment.

81. In addition to commitments relevant to its IAEA safeguards obligations discussed above, the Agreed Framework between the United States of America and the Democratic People's Republic of Korea consists of a number of actions directed towards the overall resolution of the nuclear issue on the Korean peninsula. Mutual commitments have been made to cooperate in replacing the graphite-moderated reactors and related facilities of the Democratic People's Republic of Korea with light-water reactor power plants; to move towards full normalization of political and economic relations; to work together for peace and security on a nuclear-free Korean peninsula; and to work together to strengthen the international nuclear non-proliferation regime. Details on a number of these issues remain to be worked out and negotiations between the parties are continuing.

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2. Chemical weapons-related agreements and arrangements

(a) The Chemical Weapons Convention

82. As of 21 July 1995, 32 States had deposited their instruments of ratification with the Secretary-General of the United Nations. Since February 1993, the Provisional Technical Secretariat of OPCW has been engaged in preparations for the entry into force of the Convention. 32/

83. The Chemical Weapons Convention creates a new multilateral verification body, the OPCW. The Treaty specifies an extensive, intrusive and far-reaching verification system including reporting requirements, baseline inspections, regular on-site inspections of declared chemical sites, verification of destruction and challenge inspections. It provides for "managed access" techniques designed to provide effective verification while protecting sensitive installations or information, including that of a proprietary nature, and for "facility agreements" specifying the terms and scope of a routine inspection.

84. Experience thus far has underlined the importance of a "start-up process" for a complex verification regime such as that of the Chemical Weapons Convention in order to permit sufficient time to operationalize the verification body, refine verification methods, properly train inspectors, provide for equipment and laboratories, develop health and safety standards and design and install a sophisticated data-management system at the level of both the international and the national authorities.

85. The Provisional Technical Secretariat has suggested that proper planning is heavily dependent on its receipt of appropriate data from signatory States in advance of the entry into force of the Chemical Weapons Convention particularly with respect to defining the magnitude of the operational verification tasks.

(b) Other agreements and arrangements

86. In September 1989, the United States and the Soviet Union signed a Memorandum of Understanding at Jackson Hole, Wyoming, United States, for a "Bilateral Verification Experiment and Data Exchange Related to Prohibition of Chemical Weapons" (known as the Wyoming Memorandum of Understanding). In phase I of the agreement, the parties provided general data on their chemical weapons capabilities and conducted visits to relevant military and civilian facilities between December 1989 and February 1991. In phase II the parties provided detailed data on their chemical weapons capabilities and permitted intrusive on-site inspections to verify the accuracy of certain of the data declarations; that phase was initiated in January 1994 and completed in December 1994. Five intrusive inspections took place during phase II: Russian teams inspected five United States chemical weapons facilities (two former production, two active storage and a development and test facility); and United States teams inspected five Russian chemical weapons facilities (one production, three active storage, and a development and test facility).

87. Effective implementation of the Wyoming Memorandum of Understanding was achieved through comprehensive preparatory activity, such as logistical and operational planning, inspector/escort training and mock inspections; the use of

standardized safety procedures, including the use of advanced personal protective equipment and consistency of application; the availability of the requisite technical expertise on site to explain the data declarations and answer technical questions; the development of, and securing of agreement on, procedures for accomplishing sampling and analysis, and on the verification technologies to be used during the analysis; and the resolution of issues during the conduct of the inspections in information exchange sessions. Phase II of the implementation was particularly challenging, involving a complex regime with hundreds of thousands of items associated with chemical-weapons munitions and weapons systems.

88. Implementation of the Wyoming Memorandum of Understanding has provided practical experience in carrying out several types of inspections and in confirming, to a limited extent, the accuracy of the baseline data provided for the facilities inspected. Combined with clear, complete and accurate data declarations and clear, comprehensive pre-inspection briefings of the inspection team, the procedures used during challenge inspections produced acceptable results.

89. On 1 June 1990, the Soviet Union and the United States also signed a Bilateral Destruction and Non-Production Agreement. While the Agreement has not yet entered into force, the Russian Federation and the United States have worked cooperatively since early 1992 to reach agreement on implementing it and to facilitate the Russian Federation's chemical-weapons destruction programme.

90. Several concerns regarding chemical-weapons destruction should be noted. The Russian Government has encountered serious public opposition to the proposed construction of chemical-weapons destruction facilities in heavily populated localities and to the transport of toxic substances by railroads running through urban-industrial centres. This experience underlines the need to take into account public concerns regarding the health and ecological consequences of the operation of chemical-weapons destruction facilities and the transportation of chemical toxic munitions to the sites of their dismantlement.

3. Biological weapons-related agreements and arrangements

(a) The Biological Weapons Convention

91. As of March 1995 there were 132 States parties to the Biological Weapons Convention. For the purpose of resolving compliance concerns, the Convention relies upon consultation and cooperation between States pursuant to article XII, national means of verification and regular review conferences.

92. As a result of agreements worked out among the parties at several periodic review conferences, a set of confidence-building measures was adopted. These voluntary measures provide for agreed declarations and reports designed to improve the monitoring of compliance with the provisions of the Convention. The declarations and reports are circulated by the Centre for Disarmament Affairs to the States parties in the languages in which they were submitted. 33/ Not all parties have participated in these confidence-building measures. Some States parties have emphasized that openness in research-and-development programmes,

personnel and facilities is an important element of alleviating compliance concerns.

93. There has been steadily growing interest in the development of a multilateral verification or compliance monitoring regime for the Biological Weapons Convention. At the 1991 Review Conference of States parties, an Ad Hoc Group of Governmental Experts was established to examine "potential" verification measures from a scientific and technical standpoint. In the resulting VEREX report, 21 measures were identified and compiled under the broad areas of four off-site and three on-site measures, including: information monitoring; declarations; remote sensing; off-site inspections; exchange visits; on-site inspections; and continuous monitoring. 34/ The definitions and other basic concepts developed by the VEREX Group may well have application in other verification contexts.

94. The mutually reinforcing and "multiplier" effects created by the combination of verification measures was a central theme of the VEREX report. The Ad Hoc Group concluded that the potential verification measures they had identified and evaluated could be useful to varying degrees in enhancing confidence, through increased transparency, that States parties were fulfilling their obligations under the Biological Weapons Convention. They noted that, while reliance could not be placed on any single measure to differentiate conclusively between prohibited and permitted activities and to resolve ambiguities about compliance, some of the measures in combination could provide enhanced capabilities towards that end. Different combinations of methods could produce differing degrees of effectiveness.

95. One theme of the VEREX report was the need to increase transparency in the peaceful side of biological research as a necessary foundation for the eventual development of a strengthened regime for the Convention. Cooperative activities among biological research centres could assist in developing an appropriate climate for progress on verification. Another useful mechanism might be a global epidemiological surveillance system. There is potential for the additional application of verification measures, for example, existing information collection undertaken primarily for medical or civilian research purposes might be applicable in verification and vice versa. In turn, such added benefits might make participation in the regime more attractive, particularly for developing countries.

96. The Special Conference to consider the VEREX report completed its work on 30 September 1994. The States parties agreed to establish another ad hoc group "to consider appropriate measures, including possible verification measures, and draft proposals to strengthen the Convention, to be included, as appropriate, in a legally binding instrument". 35/ The Special Conference noted that any new measures should apply to all relevant facilities and activities, be reliable, cost-effective, non-discriminatory and as non-intrusive as possible. Measures are to be formulated and implemented in a manner designed to protect sensitive commercial proprietary information and legitimate national security needs and to avoid any negative impact on scientific research, international cooperation and industrial development. The Group will submit its report to the States parties to be considered at the Fourth Review Conference or later at a special conference.

97. Efficient and reliable verification measures involve, inter alia, availability and expertise in using rapid detection methods for bacteriological (biological) and toxin weapons (BTW). The detection of BTW agents could be achieved through an analysis of their physical and biological properties. Immunotechnology and gene probe technologies are valuable components of relevant biological methods. However, because of the particular difficulties which limit technical means of verification in biological activities, they will likely need to be complemented by access to personnel and documents directly relating to the activities being investigated. The International Centre for Genetic Engineering and Biotechnology (ICGEB), a unique intergovernmental centre in the area of biotechnology and genetic engineering, is engaged in research, development and training in these technologies and aims to strengthen the capabilities of developing countries in the application of these technologies for peaceful purposes. ICGEB could have a role to play in support of verification of the Biological Weapons Convention. The World Health Organization could also contribute in this respect.

98. The example of the Biological Weapons Convention suggests that a "building block" or evolutionary process of strengthening verification may be possible if parties to an agreement lacking verification provisions subsequently incorporate voluntary transparency measures and, ultimately, agreed verification obligations.

(b) Other agreements and arrangements

(i) Russian Federation, United Kingdom and United States

99. In the absence of a verification mechanism under the Biological Weapons Convention, the Russian Federation, the United Kingdom and the United States have undertaken additional reciprocal activities to address compliance concerns. In September 1992, a Trilateral Statement of the three Governments provided for measures, including reciprocal visits to non-military and military biological facilities; reciprocal, confidential data exchanges on biological activities; reviews of potential measures to monitor compliance with the Biological Weapons Convention and to enhance confidence in that compliance; and exchanges of scientists at biological facilities on a long-term basis. Since then, joint United States/United Kingdom teams have conducted visits to non-military biological facilities in the Russian Federation, following visits by Russian Federation teams to United Kingdom and United States non-military biological facilities. Also during the period the parties exchanged questions and answers on biological weapons-related issues.

100. Full and complete implementation of the Trilateral Statement could serve as a means of gaining confidence among the parties that relevant international agreements are being implemented.

4. Conventional weapons-related agreements and arrangements

(a) The Treaty on Conventional Armed Forces in Europe

101. Because the CFE Treaty 36/ calls for conversion or destruction of many thousands of weapons, while also permitting the retention of many thousands of others, verification presents challenging requirements. In addition to limitations on five categories of conventional weapons, ceilings on military personnel have been added under the politically binding CFE 1A Agreement, although with a limited provision for verification, and with the limits not becoming mandatory until the weapons reductions have been completed. 37/

102. The CFE Treaty requires the exchange of detailed data regarding weapon inventories and personnel as well as on-site inspections of both operational and storage military sites, that are far more extensive than for any previous arms limitation agreement. It provides for challenge inspections, although the inspected party may delay or refuse such inspections. It also provides for both national and multinational technical means of verification and provision has been made for the eventual adoption of an aerial inspection regime. The Treaty provides for a forum of the parties (the Joint Consultative Group) where verification and compliance issues can be discussed.

103. To date no militarily significant violations of the Treaty have been recorded. Only a few incidents in which mistakes have been made in carrying out the provisions of the Treaty have occurred, and these have been corrected.

104. Time pressures during the final phase of negotiations resulted in the omission of several desirable provisions, in particular the finalization of an aerial inspection regime that would have provided significant benefits in relation to on-site inspections. Another troubling issue associated with CFE verification has been cost. Several parties have been unable, without being subsidized, to purchase the necessary verification equipment or to travel to meetings of the Joint Consultative Group. One practical response has been to allow all parties access to NATO's database, known as VERITY, which includes all inspection reports. This has not only helped reduce verification costs but has also given erstwhile adversaries access to a common database for the assessment of Treaty implementation. Assistance and training provided by certain States parties to help other parties in the development of their national verification mechanisms have also been important. As concerns over cost increasingly become an impediment to implementation, there has been a corresponding increase in the willingness to explore provision of "common services" and other approaches to reducing costs. 38/

105. Implementation of the CFE verification regime to date offers rather striking evidence of the beneficial effects of cooperation among participating countries in scheduling inspections and in combining the results of monitoring activities. The Treaty's provision for a permanent system of on-site inspections of military units throughout Europe has institutionalized a climate of military openness which has been both influenced by, and a contributing factor in, the increased transparency of political relations in general.

106. From the outset of the negotiating phase, trial inspections were conducted to test various proposed verification procedures. This provided essential training and preparation and allowed many potential problems to be ironed out before they were written into the final text of the agreement. CFE experts also credit trial inspections, working contacts, joint training courses and the deployment of multinational teams for both trial and operational inspections 39/ with contributing to the development of a professional corps of verification experts. Trial inspections also:

- Provided an indication of the practical feasibility of proposed verification provisions;
- Identified potential cost savings;
- Facilitated the development of common standards, procedures and practices that helped to reduce conflict during implementation and thereby helped to ensure a standard interpretation of the Treaty's verification procedures;
- Sensitized the parties to distinct political, social and military national cultures;
- Assisted each party in assessing its own verification approaches, requirements and organization.

107. The requirement for providing common services in a cost-effective manner has led to the ad hoc development of such services (in the form of NATO's Verification and Implementation Coordination Staff). Originally open only to NATO countries, these common services are now increasingly available to other States parties. This evolution from a strictly national approach to verification for the CFE Treaty towards a multilateral one has been driven by significant practical benefits and cost savings.

(b) Convention on Certain Conventional Weapons (Inhumane Weapons Convention)

108. As of 10 August 1995 there were 51 States parties to the Inhumane Weapons Convention. The Convention, which deals with prohibitions or restrictions on the use of non-detectable fragments, land-mines, booby traps and other devices, and incendiary weapons, does not include any verification mechanism.

109. In 1994, a Group of Governmental Experts was mandated by the States parties to prepare for a Review Conference of the Inhumane Weapons Convention. Developing a verification system for Protocol II (land mines) to the Convention has been one of the issues discussed at the meetings of the Experts Group. While no consensus has yet been reached, several proposals have been tabled, ranging from a system involving fact-finding missions to reliance upon confidence-building measures to assist in monitoring compliance. Judging from the ideas now under active consideration, it is possible that the United Nations, already the depositary under the Convention, could be asked to play an important role in verification, whether in the area of fact-finding, as the channel for exchange of data related to confidence-building measures or even as the verification secretariat itself. 40/

110. The Group of Governmental Experts considered various proposals to amend Protocol II to the Convention within the framework of the following clusters of issues: scope of application; definitions; prohibitions and restrictions; and verification, fact-finding and compliance. The report of the Group will be considered at the Review Conference of the States Parties at Vienna, to be held from 25 September to 13 October 1995. 41/ States parties continue to be challenged to balance the requirement for effective verification with concerns about intrusiveness. Verification costs and the respective verification roles of international and national authorities will be among the important issues negotiated at the Review Conference.

C. The United Nations and preventive diplomacy

1. Introduction

111. In identifying components of, and a United Nations capacity for, an integrated international verification system, the 1990 study noted the existing capacity of the Organization to provide impartial observers and experts (for example, in areas of fact-finding of specific relevance to disarmament and in relation to peace-keeping missions). It then went on to note that an international verification system, in addition to tasks related to monitoring compliance with specific arms limitation and disarmament agreements, could be tasked with facilitating conflict resolution efforts, early warning regarding emerging crises or identifying confidence-building measures in regions lacking them (A/45/472, paras. 244 and 245). From this perspective it is useful, therefore, to examine improvements in the capacity of the United Nations in the area of fact-finding, in the promotion of confidence-building measures in the context of specific situations of tension and in relation to other preventive diplomacy activities as both components of a developing United Nations verification capacity and activities that will be themselves facilitated by improved monitoring techniques. (Verification in relation to United Nations peace-keeping and related operations is discussed in section E below).

(a) Role of the Secretary-General in fact-finding and related activities

112. In an effort to strengthen the role of the United Nations and enhance its effectiveness in maintaining international peace and security, the General Assembly in 1991 adopted the Declaration on Fact-finding by the United Nations in the Field of the Maintenance of International Peace and Security. 42/ The sending of a United Nations fact-finding mission to the territory of any State requires the consent of that State, subject to the relevant provisions of the Charter of the United Nations. 43/ As to the role of the Secretary-General, the Declaration provided, *inter alia*, that:

> "The Secretary-General should monitor the state of international peace and security regularly and systematically in order to provide early warning of disputes or situations which might threaten international peace and security. The Secretary-General may bring relevant information to the attention of the Security Council and, where appropriate, of the General Assembly;

> "To this end, the Secretary-General should make full use of the information-gathering capabilities of the Secretariat and keep under review the improvement of these capabilities." 44/

113. Elaborating further the main points made by the Secretary-General in his report entitled "An Agenda for Peace" (A/47/277-S/24111), the General Assembly adopted resolution 47/120 A on 18 December 1992 and resolution 47/120 B on 20 September 1993, both entitled "An Agenda for Peace: preventive diplomacy and related matters". In those resolutions the role of the Secretary-General in two fields was further elaborated: the capacity of the United Nations for early warning, collection of information and analysis; and fact-finding missions.

114. In his 1994 annual report on the work of the Organization, 45/ the Secretary-General reported that initial steps had been taken to move gradually towards an early-warning mechanism and to upgrade the collection and processing of information and analysis in the Secretariat. Subsequently, in his position paper entitled "Supplement to An Agenda for Peace", issued in January 1995, the Secretary-General reported that the Department of Political Affairs, after successive phases of restructuring, was now organized to follow political developments world wide, so that it could provide early warning of impending conflicts and analyse possibilities for preventive action by the United Nations, as well as for action to help resolve existing conflicts (A/50/60, para. 26).

115. During the last several years, the fact-finding missions undertaken by the Secretary-General have generally immediately preceded peace operations, constituted part of the ongoing operations or been undertaken after a conflict has been resolved as part of efforts towards reconstruction and the consolidation of peaceful conditions. In the period from September 1992 to September 1993, the Secretary-General himself travelled to 27 countries and there were more than 100 missions of representation, fact-finding and good will offices undertaken on his behalf. 46/ For the period from September 1993 to September 1994, there were 34 high-level missions dispatched. 47/

116. In addition to efforts to mediate negotiations among parties to various disputes, tasks also included the investigation of allegations of serious human rights violations occurring after fighting broke out in Abkhazia, Georgia; reporting on elections in Moldova; a reconnaissance mission in Rwanda; and a survey mission for human rights verification in Guatemala.

117. In October 1993, the President of Mali requested the Secretary-General to provide assistance in the collection and control of illicit small arms said to be proliferating in the country. The advisory mission established in response, in visits to the Sahara and Sahel in August 1994 and March 1995 respectively, identified the need for a subregional approach to the problem and recommended, inter alia, arrangements for United Nations monitoring of a range of confidence-building measures, including joint customs patrols along borders, increased communications among armed forces in response to incidents and increased meetings of officials to coordinate relevant policy among the countries involved.

118. The Secretary-General continues to attach a high priority to preventive diplomacy and peacemaking activities as the most cost-effective techniques for

the maintenance of international peace and security. In the above-mentioned position paper entitled "Supplement to an Agenda for Peace", he identified two practical problems that had emerged: the first relating to the difficulty of finding senior persons able and willing to serve as his special representative or envoy; and the second, to the lack of clear legislative authority, and financial underpinning, for the establishment of small field missions to provide a continuing presence on the ground in support of the role of the special envoy (ibid, paras. 30 and 31).

119. Since the release of the "Supplement" paper, the Secretary-General has received a list of qualified eminent persons from certain Member States that has helped to alleviate the first-mentioned problem. Regarding the establishment and financing of field missions, the Secretary-General has indicated his intention to submit a special report to the General Assembly at its fiftieth session, suggesting options for tackling the latter problem. The Security Council, in its statement on the "Supplement" paper, expressed its belief that adequate resources must be made available within the United Nations system for such field missions. 48/

(b) Other relevant United Nations activities

120. The 1990 study discussed the role of the Department for Disarmament Affairs, the organizational unit of the Secretariat then responsible for disarmament questions. An outline was presented of the administrative assistance provided to ongoing negotiations at Geneva that included a verification dimension as well as support for the verification work of the United Nations Disarmament Commission. The servicing of expert groups, including those directed at the issue of multilateral verification of disarmament agreements, was also reviewed (A/45/372, paras. 161 and 162). Since then the Centre for Disarmament Affairs has continued to play an important role in support of various efforts in both the negotiating and deliberative bodies at the global level to identify and explore common ground between States in the area of verification.

121. Of particular relevance for the present study is the work of the Disarmament Commission on agreed guidelines and recommendations in relation to openness in military matters. Building on its 1988 guidelines for appropriate types of confidence-building measures and for the implementation of such measures on a global or regional level, 49/ the Disarmament Commission at its 1991 and 1992 substantive sessions had on its agenda an item entitled "Objective information on military matters". In May 1992, the Commission adopted by consensus the guidelines and recommendations for objective information on military matters. 50/ Described as an important confidence-building measure, one of the goals of objective information on military matters was to serve "to facilitate the process of arms limitation, reduction and elimination, as well as reduction of forces, and the verification of compliance with obligations assumed in these areas". It was agreed that the information to be provided under agreements or arrangements for the exchange of objective information on military matters should be consistent in volume, range and quality with the objectives identified by the parties. The data should be accurate and comparable, should be provided on a reciprocal basis and might, if deemed necessary by the parties, be subject to verification. The General Assembly by its resolution 47/54 B of

9 December 1992 endorsed the guidelines and recommendations for objective information on military matters as adopted by the Disarmament Commission and recommended them to all States for implementation. 51/

122. In May 1993, the Disarmament Commission adopted by consensus the guidelines and recommendations for regional approaches to disarmament within the context of global security. The General Assembly, by its resolution 48/75 G of 16 December 1993, endorsed the guidelines and recommendations and recommended them to all Member States for implementation.

123. The Centre for Disarmament Affairs augmented its capacity for regional outreach through its three regional centres for peace and disarmament in Africa, Asia and the Pacific, and Latin America and the Caribbean respectively. The Centre for Disarmament Affairs acts as the focal point for coordinating inputs to the activities of these centres. The mandates of the centres, while differing slightly in detail to reflect the specific characteristics of the region in question, charge them to provide, upon request, substantive support for initiatives and measures of peace, arms limitation and disarmament in the regions, to cooperate with regional organizations and to coordinate activities under the Disarmament Information Programme. The centres promote awareness of regional security and disarmament issues through newsletters, seminars and workshops and, increasingly, by creating networks for the exchange of data and information related to disarmament and security, including broadening contacts with research centres and academic institutions.

124. The centres, by promoting, in particular, confidence-building and transparency in military matters, are gradually becoming more directly involved in the broader sphere of preventive diplomacy. For example, the Centre in Africa has provided substantive and organizational support to the Standing Advisory Committee on Security Questions in Central Africa and to the Secretary-General's advisory mission to Mali concerning the proliferation there of illicit small arms. In addition, the Centre hosted the second meeting of the group of experts working on the treaty to establish an African nuclear-weapon-free zone.

125. The General Assembly, in its resolution 49/76 D of 15 December 1994, "encourage[d] the regional centres to continue intensifying their efforts in promoting cooperation with subregional and regional organizations and among the States in their respective regions to facilitate the development of effective measures of confidence-building, arms limitation and disarmament, with a view to strengthening peace and security". It also encouraged the centres to take into account the guidelines and recommendations for regional approaches to disarmament within the context of global security, as discussed above.

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D. Other regional and bilateral agreements and developments

1. Europe

(a) Organization for Security and Cooperation in Europe

126. The concept of confidence-building measures originated to a great extent in Europe and, more particularly, the 1975 Helsinki Final Act of the Conference on Security and Cooperation in Europe. 52/ In the confrontational atmosphere of cold-war Europe, where progress on arms control between the two rival blocs was slow, a series of simple measures was agreed upon "to reduce the dangers of armed conflict and of misunderstanding or miscalculation of military activities which could give rise to apprehension". Apart from reducing fears by making military exercises more predictable, those measures were intended to promote the growth of confidence among the participating States with respect to each other's military intentions so that further measures could be agreed, including arms limitation and disarmament measures. Almost from their outset, confidence-building measures were seen as a preliminary step towards arms limitation.

127. Through a series of follow-up meetings among the participating States and, most importantly, the Stockholm Conference of 1984-1986, a more elaborate set of militarily significant, binding and verifiable confidence- and security-building measures (CSBMs) were refined. Active verification by participating States involving quotas of on-site inspections was included. The use of aircraft overflights was also permitted, although none have been employed to date.

128. In 1994, CSCE - now increased from the original 35 to 53 participants - changed its name to the Organization for Security and Cooperation in Europe. Further elaborations of the OSCE confidence- and security-building measures were made at Vienna in 1990 and 1992 and, most recently, at Budapest in 1994.

129. OSCE has also had a conflict management dimension, which emerged subsequently, and has been most prominently represented by the Charter of Paris, adopted on 17 November 1990. This agreement involved the establishment of a Conflict Prevention Centre albeit initially with a mandate limited only to the further elaboration of confidence- and security-building measures. In addition, a number of processes and obligations relating to conflict management were developed. Also included were a variety of procedures for fact-finding in the context of security-related matters and human rights. Provisions with respect to OSCE peace-keeping were also incorporated into the Charter of Paris.

130. This dimension of OSCE has continued to evolve with the establishment of a High Commissioner on National Minorities. While the conflict-resolution mechanisms have been useful in some contexts, their rudimentary nature has rendered them incapable of addressing the complex and deep-seated problems that have arisen in the former Yugoslavia.

131. OSCE has also developed a unique computerized data-communication network that has managed to streamline the exchange of data, notifications relating to military matters and reports among the parties to the Vienna Documents and is used by the CFE Treaty parties for their communications. This multilateral

system follows on the bilateral precedents originally developed between the United States and the former Soviet Union during the cold war.

132. Compliance with the follow-on Vienna Documents of 1990, 1992 and 1994 has been good and has displayed an impressive degree of transparency and openness. The provisions for exchange of military information have been a key element in the process. This unprecedented sharing of information about military structures and activities, including verification and evaluation, has played an important role in helping to ensure stability in Europe as States go through the transition from cold war structures. In many ways, Europe is building a low-key, practical verification and confidence-building infrastructure which should prove of enduring value as a foundation for a future security structure. The OSCE regime of confidence- and security-building measures has created a "dense network of verification all over Europe and even beyond", and verification has become "a routine matter in European military security policy". 53/

133. Information provided in the annual declarations and notifications of the Vienna Declarations form the basis of subsequent verification activities. These data are checked by inspections and evaluation visits, as well as by national means. Discrepancies are discussed and resolved. Honest mistakes are made even with the best of intentions and, in a cooperative verification environment, can be corrected.

134. Another key element of OSCE, the procedure established for mandatory acceptance of inspections and evaluation visits from any OSCE State, has provided hands-on experience in verifying regional agreements.

135. Implementation of the Stockholm and Vienna documents, like the experience with the CFE Treaty and the preparations for the entry into force of the Open Skies Treaty (see paras. 138-140 below), have all involved training and trial inspections or overflights in advance of the entry into force of the agreement, helping to smooth out many of the wrinkles in implementation in a less confrontational atmosphere than would be the case once obligations had become binding.

136. Some efforts to share this experience with other regions of the world have been made, such as Canada/Republic of Korea Conventional Forces Inspection Training Workshops held in December 1992 and May 1995. OSCE has also requested help from the United Nations in promoting linkages to other verification bodies. 54/

137. OSCE has declared itself a regional organization under Chapter VIII of the Charter of the United Nations, thus underscoring its intent to work closely with the United Nations. OSCE and the United Nations have begun to work out cooperative actions in an effort to better apply the capabilities of both organizations and to avoid duplication.

(b) The Treaty on Open Skies

138. The Treaty on Open Skies 55/ is one of the most wide-ranging international efforts to date to promote openness and transparency of military forces. It

establishes a regime of unarmed aerial observation flights over the entire territory of its participants - to date 27 States in Europe and North America have signed the Treaty.

139. The Treaty is designed to enhance mutual understanding and confidence by giving all participants, regardless of size, the possibility to obtain information on military or other activities of concern to them. It is based upon four basic principles: general territorial openness and access for overflights; use of unarmed aircraft for observation flights; an agreed sensor suite, using sensors commercially available to all parties; and annual quotas for reciprocal overflights. The Treaty allows for consensus decisions in the Open Skies Consultative Commission, its implementing body, in order to upgrade sensors, adjust quotas and admit new participants.

140. As with other examples in the present chapter, trial overflights have been used, both for refining Treaty procedures and for training personnel. Another experience along the lines of that of the CFE Treaty was that a strictly national approach to verification operations has disadvantages for smaller States with more limited resources. Among the solutions in the case of the Open Skies Treaty is the pooling of aerial monitoring resources and quotas among some groups of the parties. Moreover, it is possible that NATO's VICS will undertake an important coordinating function for some, if not most, of the parties, as it has for the CFE Treaty. Since the Treaty on Open Skies explicitly requires that the sensor technology used on aircraft must be of a standard that is available commercially to all participants, an effort has been made to encourage equivalent technical capabilities among all parties. Finally, it is useful to note that, as with the CFE Treaty, notifications and other communications pursuant to the Treaty can be exchanged over the OSCE automated communications network.

(c) Other relevant European experience

141. Parallel to the development of OSCE, talks on arms control matters took place between NATO and the Warsaw Treaty Organization. Unlike the case of OSCE, this process did not directly involve the neutral and non-aligned States of the European continent. The CFE Treaty of 1990 was the most significant result of this process. Currently, efforts are ongoing with respect to harmonizing the obligations of the CFE Treaty with those of OSCE, with particular attention to their information exchange and verification requirements. A new thrust of current thinking is a focus on subregional arms control processes in Europe, taking particularly into account, the former Yugoslavia. This envisages a role for peace-keeping forces, confidence-building measures and arms limitation and disarmament measures in the post-conflict environment of that subregion. Verification, including that by neutral third parties, figures prominently in this thinking.

142. The role of the North Atlantic Cooperation Council composed of NATO members, former Warsaw Treaty Organization members and the successor States to the former USSR, is still evolving. The provisions for NACC and other OSCE countries to join in United Nations and OSCE operations, including peace-keeping, search and rescue, and humanitarian operations, may be a

precursor for future cooperative actions with the United Nations by regional organizations in the field of peace and security.

143. The Hungarian-Romanian Agreement on the Establishment of an Open Skies Regime, obliges each State to accept four overflights annually, regardless of additional commitments assumed under other multilateral or bilateral treaties. Several overflights have occurred under this agreement. At a meeting of the Hungarian-Romanian Consultative Commission held in June 1994, the parties expressed their satisfaction that the Agreement was indeed contributing to mutual confidence, transparency and good-neighbourly relations between the two countries. They also stressed that their bilateral Agreement was regarded by other countries as an important step in the implementation process of the multilateral Treaty on Open Skies.

144. Confidence-building measures have been important precursors of more ambitious arms limitation and disarmament measures in Europe. Verification has played an indispensable role in this process. Recent years have seen the emergence of OSCE fact-finding, cooperation among the United Nations, OSCE, NATO, WEU, CIS and other regional organizations on peace-keeping and other conflict management activities in Europe.

2. Latin America

145. In 1991, Argentina, Brazil and Chile signed a Joint Declaration on the Complete Prohibition of Chemical and Biological Weapons, known as the Mendoza Accord. That agreement, as well as ABACC (see paras. 61-62 above), provides practical experience in how to approach verification in the context of regional cooperation.

146. In 1990, the Governments of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua resumed their efforts to reduce their forces and weapons. This process, which began in 1983 under the auspices of the Contadora Group, continued in 1992 under the direction of the Central American States. The countries reaffirmed their desire to open the negotiations on security, verification, civilian control and arms reductions, as called for in the Esquipulas II agreements. 57/ A regular process now exists to accomplish their goals operating through discussions in the Central American Security Commission.

147. The General Assembly of the Organization of American States (OAS), a regional organization which focuses, *inter alia*, on arms limitation and non-proliferation, has adopted four resolutions on arms control and security, one of which called for the convening of a meeting of governmental experts to discuss the development of regional confidence- and security-building measures. At a meeting held at Buenos Aires, from 15 to 18 March 1994, the governmental experts developed a list of military and non-military confidence- and security-building measures for countries to consider in their bilateral, subregional and regional relations. The military measures included: notification of troop movements and manoeuvres, exchange of information, exchange of personnel, communications, contacts, training and education. The non-military confidence- and security-building measures were measures of a political, diplomatic,

educational and cultural nature. A further OAS meeting on confidence- and security-building measures is to be held at Santiago in the autumn of 1995.

3. The Korean peninsula

148. Relevant bilateral developments regarding the Korean peninsula are discussed in paragraphs 78 to 81 above.

4. The Middle East

149. Within the context of the Arms Control and Regional Security Working Group of the Middle East peace process, a number of initiatives are under way. The Working Group is composed of two "baskets": the operational and the conceptual. The operational basket deals with concrete confidence-building measures. 58/ The regional delegations have approved the creation of a regional communications network. They have agreed on subjects and formats for an exchange of military information. Finally, they have established a text for a document on the multilateral prevention of incidents at sea and for enhanced regional cooperation for search and rescue. In the conceptual basket, regional delegations are considering such issues as: the definition of the region for arms control purposes; long-range views on security in the region; and the verification questions associated with the creation in the region of a zone free of weapons of mass destruction. The conceptual basket has discussed these issues at a number of meetings and conferences, including a verification seminar hosted by Egypt in 1993. The conceptual basket has also visited a number of facilities to review verification procedures, including both Swiss and Finnish chemical facilities. Finally, the Working Group has approved the creation of three regional security centres to be based in the region. 59/

5. South Asia

150. India and its neighbours have negotiated a range of confidence-building measures covering three broad categories: (a) political, including declarations of intent, discussions on security-related concepts and doctrines, and measures aimed at improving people-to-people contacts and broadening the base for bilateral relations; (b) communications-related, such as hot lines, dedicated channel links, risk-reduction mechanisms and periodic meetings of officials to discuss issues and defuse tensions; and (c) technical, including activities relating to arms limitation and transparency, such as prior notification and constraint measures.

151. India and Pakistan have signed a number of bilateral confidence-building agreements, including those on avoidance of airspace violations, prior notification of troop movements and exercises, joint patrolling of border areas, establishment of communications links at the senior military level, an agreement not to attack each other's nuclear facilities and a joint undertaking not to develop, produce, acquire or use chemical weapons.

152. India and China have been engaged in a process of enhancing confidence between the two countries in border areas since 1988, with the establishment of a Joint Working Group on the boundary question, which has focused on such measures as prior notification of military exercises in the area along the line of actual control. An important step forward was the Agreement on Peace and Tranquillity along the Line of Actual Control in the India-China Border Areas, signed in September 1993. Under that Agreement, both countries agreed to negotiate a series of confidence-building measures, including possible reductions of military forces deployed along the border, consistent with the principle of mutual and equal security. An expert group has been formed to assist in the implementation of the Agreement. In addition, exchanges between defence colleges and security-related institutes and high-level defence visits have provided for greater contacts and exchange of views between the two countries.

6. South-East Asia

153. Following on a history of bilateral and trilateral security contacts, the countries of the Association of South-East Asian Nations (ASEAN), together with their dialogue and consultative partners and ASEAN observers, held the first meeting of the newly established ASEAN Regional Forum at Bangkok, on 25 July 1994. The meeting was in accordance with the 1992 Singapore Declaration of the Fourth ASEAN Summit, by which the ASEAN Heads of State and Government had proclaimed their intent to intensify ASEAN's external dialogues in political and security matters as a means of building cooperative ties with States in the Asia-Pacific region.

154. The Bangkok meeting was the first time that high-ranking representatives from the majority of States in the Asia-Pacific region had come together specifically to discuss political and security cooperation issues and was considered an historic event for the region, signifying a "new chapter of peace, stability and cooperation for South-East Asia". [60]

155. The 1994 meeting participants agreed to convene the Regional Forum on an annual basis, and to hold the second meeting in Brunei Darussalam in 1995; to endorse the principles and purposes of ASEAN's Treaty of Amity and Cooperation in South-East Asia, as a code of conduct governing relations between States and a unique diplomatic instrument for regional confidence-building, preventive diplomacy and political and security cooperation; and to entrust the incoming chairman with substantive preparations for the next meeting, including the collation of ideas for further study such as confidence- and security-building, nuclear non-proliferation, cooperation in regional peace-keeping training, exchanges of non-classified military information, maritime security issues and preventive diplomacy. Finally, recognizing the need to develop a more predictable and constructive pattern of relationships for the Asia Pacific region, participants expressed their "firm conviction" to work towards the strengthening and the enhancement of political and security cooperation within the region, as a means of ensuring lasting peace, stability and prosperity for the region and its peoples.

156. ASEAN signalled its interest in promoting closer United Nations-ASEAN ties by its introduction at the forty-seventh session of the General Assembly of a resolution seeking general endorsement of the Treaty of Amity and Cooperation, which it obtained unanimously. 61/ In addition, Thailand has sponsored three ASEAN-United Nations workshops on the United Nations and preventive diplomacy with participation on a pan-Pacific basis.

E. Verification under United Nations Security Council mandate

1. Peace and security operations

(a) Introduction

157. It is only in recent years that verification per se has been recognized as a normal part of peace and security operations. 62/ Verification objectives have been pursued using a number of verification methods which can be described in a functional manner. Although many of the verification methods have remained the same, there have been a great variety of verification objectives defined for these recent operations. It is important to note that all measures of verification depend upon the specific mandate given by the appropriate authority. The verification objectives and methods are outlined in the following paragraphs and are summarized in annex I to the present report.

(b) Verification objectives

(i) To confirm cease-fires/cessation of hostilities, troop withdrawals and redeployments

158. In the wake of a cease-fire, peace-keeping missions consisting of military observers are often mandated to monitor an established demilitarized zone, to deter violations through their presence and to observe any hostile action mounted from the territory of one State against the other. Standard observation techniques are used, supplemented by modern, improved equipment, such as night surveillance devices, ground positioning systems, high-quality communications, etc. This equipment has greatly improved the capability of ground patrols and observation posts manned by military observers, as has the increased use of aerial and maritime resources. When tension increases and it is clear that unarmed military observers are not a sufficient deterrent to incursions in the DMZ, the mandate can be expanded, under appropriate authority, and the mission allocated armed peace-keeping forces.

159. Investigations of alleged violations (a form of fact-finding), use of liaison officers to maintain contact and develop relationships (a confidence-building measure) and freedom of movement for patrols (a form of transparency) demonstrate the close linkage between peace-keeping and security operations and traditional arms control and disarmament verification procedures. As with other types of verification and with all other verification objectives in peace and security operations, the "verifiers" will be making assessments and exercising professional judgement in the context of the situation on the ground. There will rarely be any absolutes.

(ii) To confirm demilitarized zones, areas of limitation, no-fly zones, protected and safe areas

160. The agreement by the parties to particular restrictions lends itself to specific verification of adherence to those restrictions, for example, to the conduct of inspections at the time and place chosen by the peace-keeping operation. The definitive agreement of the parties to certain limitations and deployments also facilitates the development of baseline data from which the mission can verify the integrity of agreements entered into and make adjustments in relation to those agreements, as the situation demands. In addition to the utilization of unarmed military observers in this situation, there is a role for the deployment of armed military units in order to provide the parties with a sense of security. Demilitarized zones, demarcated areas of separation and areas where designated numbers and types of weapons are permissible all contribute to facilitating verification against a standard, agreed by all parties to the conflict.

161. Monitoring, as mentioned above, is done by deployed forces and military observers occupying static positions and observation posts, through the occupation of temporary observation posts and by foot and vehicular patrols. Regular inspections are carried out in the areas of limitation. Investigations can be carried out at any time when one of the parties makes an allegation against the other.

162. A subset of this objective is the monitoring of arms which, by agreement of the party or parties, have been sequestered for a period of time or under a specific set of circumstances.

163. In one major peace-keeping operation, 63/ the Security Council has created a "no-fly" zone and the mission has assigned specific resources to this verification task. In addition to the use of military observers as monitors at airfields in the mission area, the operation relies on support provided by a regional organization for the provision of aerial monitoring and airborne radar coverage. Liaison officers have been exchanged and communications exist to allow immediate follow-up of all reports from the peace-keeping operation to the supporting organization and vice versa.

164. Certain conflicts have given rise to a new concept in peace-keeping operations, the designation of "protected" 64/ or "safe" 65/ areas. These two concepts are still being elaborated and have led to many different interpretations. The development of a generally recognized concept of safe or protected areas with appropriate measures for verification could play a useful role in settling conflicts, provided there is the requisite political will to do so.

165. Protected areas were intended to protect minority populations against hostile majorities through such measures as demilitarization, provision for continuation of local government and policing under United Nations monitoring. The safe area concept was devised in the context of humanitarian operations in order to facilitate delivery of that form of assistance wherever needed. When fighting between factions interfered, the Security Council designated certain towns and cities as safe areas in order to attempt to ensure that there was free

and unimpeded access for the delivery of humanitarian assistance and the safe transfer of the sick and wounded. In other cases, missions have been asked to contribute to the security and protection of refugees and civilians at risk, including the establishment of "secure humanitarian areas". 66/ The verification methods for protected and safe areas include deployment of forces in the immediate vicinity, provision of escorts, aerial surveillance and patrolling by military observers and police monitors.

166. Another type of "restricted" 67/ area was created when, at the request of the Government concerned, the Security Council authorized the dispatch of forces and observers to that country in a preventive deployment meant to help contain the conflict. The task was to monitor and report any developments in the border areas. This verification of "no activity" is carried out by patrolling and the manning of observation posts. This operation can also be seen as a confidence-building measure in its own right.

(iii) To confirm relocation, cantonment, disarming and demobilization of forces in an internal (intra-State) conflict

167. Strict verification is an integral part of the step-by-step process in each operation. Using a system of patrols, escorts and liaison, the military observers and, in some cases, deployed forces monitor the reduction of the numbers of arms and armed personnel. In a number of instances, the physical destruction of weapons has been carried out directly by mission personnel or under their supervision. In most cases the baseline data on which the verification was based was developed and agreed in conjunction with the parties. In other situations the data had to be developed "from scratch" by the missions, without the assistance of the parties. In addition to the methods described above, in one instance there was, inter alia, the first use of United Nations maritime patrol and surveillance forces.

(iv) To validate sanctions

168. While the United Nations has long utilized the provisions of Article 41 of the Charter (concerning measures not involving the use of force), it is only in recent years that peace and security operations have contributed directly to monitoring or enforcing sanctions. Verification has been required in order to determine the effectiveness of arms and other embargoes. It has been carried out in some cases by the United Nations personnel and in others, under a United Nations mandate, by regional organizations or multinational coalitions that possessed the necessary resources to verify the presence, or absence, of compliance. Verification methods, ranging from mobile patrols and checkpoints along frontiers and monitors at airports and seaports to intercepts at sea, the use of maritime and aerial assets, including satellite surveillance, provided from national, multilateral and regional resources, contributed in no small measure to the effective implementation of the sanctions/embargoes. For a further discussion of sanctions see section E.2 below.

(v) To validate the conduct of free and fair elections and referenda

169. Many peace and security operations are designed to set the conditions for, and end with, the conduct of "free and fair" elections as the culmination of the

peace or settlement process. This process includes observing both the registration process and the election itself. In most cases the operations only had responsibility, often shared with other organizations including NGOs, for the verification aspect. In one case, however, the United Nations had the responsibility actually to conduct the registration and election. The verification methods used were in most cases no different than for any democratic election process.

(vi) To monitor functioning of the local police/record major violations of human rights

170. In a number of operations the agreed settlement provided for the continued functioning of police forces with the proviso that their conduct be monitored in order to verify that justice was being administered in a fair and equitable manner for all parties. The presence of United Nations civilian police monitors has now become almost routine as they are deployed in 9 of the current 16 peace-keeping operations and have a monitoring, i.e., verification, function in 5 of the 9 operations. The verification methods include joint patrolling and investigations as well as the monitoring of procedures at police posts and headquarters.

171. As the scope of peace and security operations began to expand in the early 1990s, one of the innovative verification objectives established was the monitoring of human rights in the context of settlements of intra-State conflict, i.e., to investigate cases and situations involving allegations of human rights violations and to follow up those allegations with the competent authorities and the parties to the conflict. This active verification and compliance mandate is directed not only at an objective recording of facts, but also at the exercise of good offices aimed at assisting efforts by the parties to find a remedy to violations. The verification methods have included the establishment, as part of the peace-keeping mission, of a human rights division, utilizing human rights experts and legal staff to investigate complaints and make recommendations for corrective action.

(vii) To monitor the provision of humanitarian relief

172. Under conditions where an individual State has disintegrated and/or the provision of basic services has broken down owing to conflict or other causes, security for aid workers is often a consideration; it is also necessary to ensure that the aid and assistance is being delivered to the intended recipients. Military observers and United Nations civilian police have been used to good effect, as have armed security elements.

173. In some cases, in addition to a cease-fire between the parties in conflict, the movement and/or return of refugees and internally displaced persons has been a feature of agreements. Again, monitoring has been required to ensure no harassment by other parties and the provision of minimum services to those involved.

(c) New verification technologies

174. It is worth reiterating that verification methods in peace and security operations in recent years have been assisted by the introduction of new technologies and, in some cases, the employment of non-traditional platforms for the technology. The new technology is mainly in the areas of acoustic and movement sensors and communications and gives the verifiers the capacity to work with much greater speed and efficiency as well as an ability for round-the-clock operations. Fixed- and rotary-wing aircraft have become the norm in operations, whether they are providing third-party support to United Nations forces or are an integral part of the mission itself. In addition to being able to conduct airborne patrols and surveillance, to move personnel rapidly to inspection sites and so on, the aircraft carry sensors that allow night and poor weather observation as well as communication monitoring. Unmanned aerial vehicles, such as drones, may also be increasingly used, especially where the use of manned platforms is unduly risky. As technological developments progress in the miniaturization of sensor equipment, the capacity of these vehicles to contribute to aerial surveillance will be greatly enhanced.

175. Ships provide another platform for the conduct of certain verification activities, in particular the monitoring of sanctions and maritime demilitarized zones.

176. Satellites are very much in use in peace-keeping operations, mainly as an aid to communication via third parties; they are being used increasingly for the dissemination of information. Commercial satellites are now available for this role and provide a somewhat independent source for organizations such as the United Nations.

(d) The United Nations Situation Centre

177. The recently established United Nations Situation Centre (SITCEN) provides information to the decision makers in the Department of Peace-keeping Operations and elsewhere. Although clearly not in the direct business of verification, SITCEN provides essential services to those who direct certain verification activities and assists in the reporting of the results to decision makers.

(e) Summary of experience

178. Experience with the verification aspects of peace and security operations indicates that problems have emerged because of the lack of:

- Clear mandates concerning arms limitations and other obligations so that verification objectives can be better defined;
- The requisite resources so that appropriate methods can be used in support of the verification objectives;
- More systematic and better collection and analysis of information from ground reconnaissance, aerial surveillance and information processing systems;

- Independent sources of information and analysis;
- The ability to exploit more fully advances in technology, especially in the areas of communications and surveillance;
- Recognition of the advantages of pursuing informed consent of the parties to a conflict (in the sense of providing as much detail as is possible) in order to build confidence, encourage transparency and ease verification;
- Better use of public information and public relations techniques to explain the verification aspects of the mission to all parties (a form of transparency in reverse);
- Better training in new techniques of arms control and force limitation such as relocation, disarming, cantonment and demobilization.

2. Sanctions

179. Under Article 41 of the Charter of the United Nations, the Security Council may call upon Member States to apply measures not involving the use of armed force in order to maintain or restore international peace and security. Such measures are commonly referred to as sanctions. Sanctions commonly involve the embargo of arms and/or other trade to the party in question. The implementation of sanctions is a complex matter, during the course of which the following objectives must be considered: to modify the behaviour of, not to punish or exact retribution from, the country or party under sanctions; to minimize the impact of sanctions on vulnerable groups and to ensure that appropriate measures are taken for humanitarian supplies to reach affected populations; and to minimize collateral damage from sanctions on neighbouring or other States. 68/

180. To date, the Security Council has established eight committees to oversee implementation of sanctions, in respect of South Africa, Iraq, the former Yugoslavia, the Libyan Arab Jamahiriya, Somalia, Haiti, the National Union for the Total Independence of Angola (UNITA) and Rwanda, respectively, with the scope differing from case to case. Some are limited to arms embargoes (South Africa, Somalia, UNITA in Angola, and Rwanda), while others are more comprehensive (Iraq and the former Yugoslavia). The committee on the former Yugoslavia, established in 1991, was given a mandate that included the power to recommend measures in response to violations 69/ and to approve exceptions to the embargo. 70/ The committees established since then (Libyan Arab Jamahiriya, Somalia, Haiti, UNITA in Angola, and Rwanda) have similar mandates.

181. The sanctions committees are usually asked to perform a series of tasks and to report on their work to the Security Council with their observations and recommendations. There are several types of tasks that the committees may be asked to perform:

(a) Development of guidelines for the implementation of measures imposed by the Council or to study ways and means by which such measures could be made more effective; 71/

(b) Collection and examination of information submitted by States on actions they have taken for implementation with a view to making recommendations to the Council. They are also asked to examine the Secretary-General's progress reports on implementation and to make appropriate recommendations to the Council;

(c) Dealing with violations through consideration of information brought to their attention by States concerning violations, making periodic reports of such violations to the Council (identifying where possible persons or entities, including vessels, reported to be engaged in the violations) and recommending appropriate measures in response; 72/

(d) Approval of exceptions on application by States to the measures imposed by the Security Council, for example, on grounds of significant humanitarian need. 73/

182. The sanctions committees themselves have no operational verification mechanisms. They have to rely on the efforts of individual Member States, acting singly or with others. Such cooperation can take several forms: unilateral, multilateral or the utilization of regional organizations. Verification mechanisms/bodies that have been relied upon include: the European Union (EU)/(OSCE), sanctions assistance missions in the countries bordering the former Yugoslavia; the joint operation by NATO and WEU in the Adriatic Sea; the WEU monitoring mission on the Danube; and a multilateral naval patrol enforcing the United Nations embargo in respect of Haiti.

183. Close interaction between the Sanctions Committees and the verification mechanisms/bodies in the field is a critical factor in the effective implementation of sanctions. One example of such interaction is the EU/OSCE sanctions assistance missions. A Sanctions Coordinator acts in liaison with the sanctions assistance missions and reports to the appropriate sanctions committee of the Security Council.

184. Member States may monitor and enforce the implementation of sanctions in various ways, for example, surveillance, data collection, inspections, investigation of allegations of violations, etc. Depending on the mandate from the Security Council, sanctions implementers may have the right to use force to ensure compliance, commensurate to the circumstances. Adequate verification mechanisms can contribute to focusing the sanctions on specific targets within the subject country rather than the population in general. For example, a verification mechanism involving the World Health Organization and an internationally recognized commercial supplier facilitated the examination by the Committee on the former Yugoslavia of the proposal by the Russian Federation to supply natural gas on a humanitarian basis to affected populations.

185. Problems have resulted from an inability to supplement the efforts of individual States with international or regional mechanisms for monitoring and/or enforcement of sanctions. Currently an ad hoc approach is used, lacking systematic procedures, including the failure to delegate to personnel in the field the authority for the routine authorization of humanitarian assistance. Confirmation, through effective verification of compliance, could help to avoid

some of the unintended impacts of sanctions, thus rendering it a more effective tool in critical situations.

186. Verification of the sanctions is costly and to date no satisfactory means of burden sharing has been devised. Problems have arisen in the assessment of the potential impact of sanctions on both the target country and third countries, in the monitoring of their application, in the delivery of humanitarian assistance to vulnerable groups and in both the measurement of collateral damage and the evaluation of claims submitted under Article 50 of the Charter. The Secretary-General, in his position paper entitled "Supplement to an Agenda for Peace", has made a recommendation for the establishment of a mechanism for sanctions implementation (A/50/60-S/1995/1, paras. 74-76).

3. The United Nations Special Commission and the International Atomic Energy Agency in Iraq

187. Section C of Security Council resolution 687 (1991) of 3 April 1991 requires the elimination, under international supervision, of Iraq's weapons of mass destruction and ballistic missiles with a range greater than 150 kilometres, together with the related equipment and facilities. It also calls for measures to ensure that the acquisition and production of such weapons are not resumed. UNSCOM was set up to implement the provisions concerning chemical and biological weapons and missiles and to provide assistance and cooperation to IAEA in the nuclear areas. The Director General of IAEA was entrusted with the task of eliminating Iraq's nuclear-weapons programme. This operation is unique in that it is the first and only commission which was set up by the United Nations for the implementation of disarmament and inspection procedures in a single Member State, pursuant to a Security Council resolution which was adopted under Chapter VII of the Charter and which also affirms that such measures represent steps towards the goal of establishing in the Middle East a zone free from weapons of mass destruction and all missiles for their delivery and the objective of a global ban on chemical weapons. It is also the first time that IAEA was given a mandate by the Security Council going beyond the Agency's safeguards agreements with Member States.

188. UNSCOM was mandated: to carry out immediate on-site inspection of Iraq's biological, chemical and missile capabilities; to take possession - for the purpose of their destruction or removal or for rendering them harmless - of all chemical and biological weapons, all stocks of agents, or all related subsystems and components and all research, development, support and manufacturing facilities; to supervise the destruction by Iraq of all its ballistic missiles with a range greater than 150 kilometres and related major parts, repair and production facilities; and to monitor and verify Iraq's compliance with its obligations not to use, develop, construct or acquire any of the items specified above. The Director General of IAEA is mandated to carry out similar activities in the nuclear field.

189. Since September 1991, when the scope of the clandestine Iraqi nuclear-weapons development programme was ascertained, 74/ IAEA has supervised the systematic destruction of facilities, equipment and other items proscribed under Security Council resolution 687 (1991). 75/

190. In total, UNSCOM has inspected over 200 undeclared sites in the light of their potential for the storage of chemical and biological weapons. In the chemical field, Iraq has acknowledged the production or import of over 212,000 filled and unfilled chemical munitions, nearly 4,150 tons of agent and nearly 18,000 tons of precursor chemicals. 76/ In the biological field, in the face of mounting evidence that it was engaged in an advanced military biological programme, Iraq was due to hand over to UNSCOM a full account of its programme in early August 1995.

191. Pursuant to Security Council resolution 715 (1991) of 11 October 1991, UNSCOM and IAEA are also mandated to engage in the long-term monitoring and verification of Iraq's compliance with its unconditional obligations not to use, retain, possess, develop, construct or otherwise acquire any weapons or related items prohibited under section C of resolution 687 (1991). In this connection, UNSCOM and IAEA have the right to carry out inspections, at any time and without hindrance, of any site, facility, activity, material or other items in Iraq. 77/

192. There are two common techniques utilized by UNSCOM and IAEA in their disarmament and inspection operations on-site: ground-based and aerial inspections. Ground teams typically utilize hand-held video and still cameras in their routines. Personnel carry gamma detectors for nuclear inspections and chemical agent monitors or "sniffers" that detect chemical warfare agents and some precursors in chemical weapons inspections; samples are taken for analysis and relevant documentation is gathered for review. 78/ Interviews and discussions with personnel and the study of documents are also an important part of the overall process.

193. The Security Council in its resolution 707 (1991) of 15 August 1991 authorized the Special Commission and IAEA to conduct both fixed-wing and helicopter flights throughout Iraq for all relevant purposes, including inspection, surveillance, aerial surveys, transportation and logistics, without interference of any kind and upon such terms and conditions as might be determined by the Special Commission. UNSCOM has under its full-time control both fixed-wing and rotary-wing aircraft. 79/

194. For its long-term monitoring in Iraq, UNSCOM is utilizing remote-control, heat- or motion-triggered cameras at various chemical, biological and ballistic missile sites. These cameras are linked by radio and telephone land-line to the UNSCOM/IAEA Monitoring Centre at Baghdad. There is also a series of tamper-proof tags and seals. In addition, chemical air sampling devices are deployed at chemical-weapons facilities to monitor the atmosphere.

195. With the approval of the long-term monitoring plan by the Security Council in November 1991, 80/ IAEA began phasing in relevant activities such as material accountancy and containment measures. These, in turn, have necessitated the establishment of inventories of nuclear material and other nuclear-related items, the application of seals and the tagging of equipment subject to the plan.

196. Despite the uniqueness of the mandate, particularly in relation to the unprecedented levels of access granted to inspectors, for the most part methods and procedures in general use in disarmament and monitoring activities have been

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used by UNSCOM and IAEA. However, the implementation of Security Council resolution 687 (1991) amounts to a "verification laboratory" for the testing, particularly in combination, of a wide variety of old and some new verification methods, procedures and techniques.

197. Baseline data from accurate and complete declarations is the essential foundation for further verification activities and a frame of reference for comparisons with information from other sources. Deliberate withholding of some of the data by Iraq was overcome, in large part, by the extraordinary inspection rights of UNSCOM and IAEA on a short- or no-notice basis. Detecting, locating and identifying undeclared facilities and activities proved to be a significantly more difficult task than verifying the accuracy of information regarding declared facilities and activities, but both were important for effective verification.

198. Access to nationally derived information from Member States was important for site designation by UNSCOM and IAEA and a close working relationship between them and Member States was beneficial in this regard. Photo imagery generated by the U-2 aircraft, operating under UNSCOM's control and processed by UNSCOM analysts, provided an effective, independent overhead imagery capability. Commercial satellite imagery also proved useful, as did helicopters equipped with gyro-stabilized cameras for close-range surveillance, including direct support of on-site inspection teams. UNSCOM's Information Assessment Unit, which collected, compiled and analysed data from many sources, including overhead imagery, has proved to be a key element in directing activities and providing factual assessments.

199. UNSCOM and IAEA have found no-notice or short-notice, ground on-site inspections to be their single most important verification tool. At the same time, ground inspectors alone are insufficient, as they require information provided by airborne platforms or other sources to direct them where to inspect.

200. Both UNSCOM and the Provisional Technical Secretariat of OPCW have benefited from a close and ongoing dialogue on methods and approaches.

201. With the requirement for the organization and management of complex, multinational inspection teams on relatively short notice, UNSCOM has provided unique training benefits for Member States which rotate personnel through it. More than 60 Member States have provided UNSCOM with qualified experts in chemical and biological fields. They constitute now a first corps of professional verifiers with work experience within multinational teams available to the United Nations and other international bodies.

V. LESSONS FROM RECENT EXPERIENCE AND IDEAS FOR GUIDELINES AND PRINCIPLES FOR THE INVOLVEMENT OF THE UNITED NATIONS IN VERIFICATION

A. Lessons from recent experience

202. In this opening section of chapter V, the Group of Experts attempts to draw out some general lessons - both old and new - from this recent verification

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experience. References to particularly salient specific cases that support these general lessons are given end notes where appropriate. For convenience, these lessons are broken into two general categories: first, lessons relating to the concept and general application of verification, and second, lessons about the management or practicalities of verification activities. It should be noted that these categories overlap and are not intended to be mutually exclusive. Equally important, lessons derived in particular contexts will not necessarily apply in every verification case. An important aspect of the present study has been to identify both the similarities and the differences among various categories or contexts of verification activities.

203. The survey in chapter IV amply demonstrates the wealth of experience that has accumulated and continues to grow with respect to verification. It also demonstrates that a growing proportion of this experience is multilateral in nature, including that of the United Nations. These trends seem likely to continue in the future.

1. Concept

204. Cross-fertilization of lessons. The nature of verification has evolved both as practical experience increases and as the verification objectives become increasingly diversified. An important lesson seems to be that verification in each context may benefit from the experience gained and methods used in the others. 81/ Experience further supports an underlying theme of the present report: that global, regional and bilateral processes may be linked and that each can benefit from the verification lessons learned in the others. 82/

205. Evolution of verification in specific agreements. Verification processes within specific agreements have the potential to evolve. 83/ What might have been too ambitious politically in terms of verification at one time may become more feasible as the political context of agreements moves from a more confrontational environment to a more cooperative one and as new verification techniques become available.

206. Verification and confidence-building. Verification can, where appropriate, play a key role in monitoring compliance with confidence-building measures, through enhancing the degree of confidence achieved. 84/ It is also possible to conceive of an evolutionary process that begins with modest confidence-building measures, followed at a later stage by more ambitious ones, perhaps including verification measures, which in turn would be followed by more rigorous arms limitation and disarmament measures with full verification provisions. 85/

207. Transparency. The clear lesson emerging from relevant international verification experience since the 1990 study is the centrality of transparency to effective (including cost-effective) verification. 86/ The evolution of political will can facilitate increased transparency which, in turn, contributes in a positive manner to the successful implementation of arms limitation obligations and reduced requirements for formal verification. These observations are mirrored in both bilateral and in multilateral experience. 87/

208. Verification and cooperation. Full cooperation in verification efforts, including access to information and sites can prove instrumental in providing desired assurances. 88/ Actions or declarations that go beyond the verification requirements can enhance transparency and reduce the need for formal verification. 89/

209. Military significance. Military significance has been a standard test of effective verification in traditional, particularly bilateral, verification contexts. The test of military significance also has great relevance to certain peace operations where the military risks from violations may be of immediate concern. In multilateral agreements, it is up to each party to develop its own definition of military significance based on the purposes of the agreement and their impact on its own national security needs.

210. Early warning. The 1990 verification study identified early warning as one of the functions of the verification of arms limitation and disarmament agreements. This assessment has been borne out by recent verification experience. Since that time, verification has broadened its aim to ensure early detection of even preliminary efforts aimed at acquisition of a proscribed capability. Early warning appears to have equally important application in United Nations activities in preventive diplomacy and conflict management. It also applies to confidence-building contexts, especially where the aim of the agreed measures is to provide timely assurance of the absence of hostile intent or provocative activities.

211. Undeclared activities and facilities. Recent experience indicates that focusing exclusively on verifying the accuracy of declared information about activities and facilities may not always be sufficient for determining compliance. 90/ Increased attention is now being paid to detecting the existence of undeclared activities and facilities - a much more difficult verification problem. 91/ Verifying the absence of undeclared activities and facilities implies a requirement to ensure agreed access to information and sites. Enhanced openness, while it will help, may not give an absolute guarantee of the absence of undeclared activities and facilities. 92/

212. Non-discrimination. It remains clear that future multilateral arms limitation and disarmament agreements must be non-discriminatory in their restrictions and their verification regimes. 93/ Some recent experience suggests that, in designing and implementing verification obligations, it is important to ensure an equitable distribution of the burden among the parties. 94/ The final test of non-discrimination should rest on whether implementation provides fair and balanced treatment of all parties.

213. Protection of national and commercial secrets. There is a wealth of experience suggesting that effective verification can be undertaken and agreed-upon access allowed without necessarily compromising national or commercial secrets. 95/ Ensuring the protection of confidential data observed during verification operations remains an important dimension of successful verification operations, particularly for international bodies. 96/

214. Abuse of verification. Care should be taken to prevent the abuse of verification, and measures that could reduce this possibility should be

carefully considered and deliberated during the negotiation of verification provisions, while recognizing that parties to an agreement have an obligation to demonstrate compliance in the course of implementing effective verification and to refrain from impairing, evading or interfering with that process. Measures to limit the abuse of verification procedures are found in the "managed access" provisions of the Chemical Weapons Convention, which are not yet in force and therefore cannot yet be evaluated.

215. Non-disarmament considerations. The need to take into account non-disarmament issues when designing and implementing verification provisions is demonstrated in the experience reviewed. 97/ Such issues may include local environmental standards and public concerns, as well as legal protections regarding privacy.

216. Neutral "third party". Recent experience suggests that parties may request neutral "third-party" verification in certain contexts, particularly when the level of hostility among the parties is high. 98/ Verification assistance, such as that offered by the United Nations, when acceptable to all parties, can be essential to the full participation by all parties in the verification process. 99/ Neutral third parties may be essential in initiating confidence-building efforts and facilitating the implementation of concrete measures.

2. Management

217. Benefits and costs. Balancing verification costs and benefits in an effective manner will be a continuing challenge for the United Nations and Member States alike. Verification benefits can include determination of compliance, deterrence of non-compliance, clarification of ambiguities, transparency and timely warning. Verification costs, defined broadly, can include financial outlays and human resources and equipment expenditures and, more broadly, may entail the risk of divulging confidential information that is outside the requirements for verification. One lesson of recent experience appears to be that parties are demanding more strongly that verification benefits be demonstrably commensurate with verification costs.

218. Cost-effectiveness. Another recurrent theme throughout recent experience is the need to ensure cost-effectiveness in verification implementation. In many cases, a positive political atmosphere, combined with economic and other developments, is contributing to creative efforts at more cost-effective verification techniques and regimes. 100/

219. Level of assurance. In many circumstances it is virtually impossible, for technical reasons, to guarantee the absence of undeclared activities or objects. Care must therefore be taken to distinguish between the high level of assurance which can generally be provided in respect of the verification of declared activities and the necessarily lower level of assurance which verification can provide in relation to undeclared activities.

220. National versus multilateral verification. There is little evidence in recent experience to suggest that multilateral verification regimes based on

strictly national rights and obligations 101/ are cheaper in terms of resources or financial costs. In the long run, having an international body do part or all of the verification tasks on behalf of the parties may result in savings for all. In other words, the sum of each country's costs for conducting verification under a national verification approach may not be cheaper than the cost of having an international body acting for the countries provide common verification services. While the ultimate judgement about compliance questions remains a national responsibility, recent practical experience suggests that a reappraisal of the benefits of such common services by international organizations may well be warranted. 102/ Even without the involvement of an international body, the benefits associated with cooperative monitoring or other types of pooling of verification resources is supported by recent experience. 103/

221. Common services. Sometimes the practical requirements for common services may drive an evolutionary development of ad hoc procedures among parties when none is explicitly provided for in formal agreements. 104/ The lesson here seems to be that some degree of centralized management or coordination, perhaps by an international body, can provide common services to parties, which they might not easily achieve when acting independently.

222. Synergies. The idea of synergy - the multiplier effects of using several methods in combination to increase their individual as well as overall effectiveness - applies to both traditional and new verification contexts. In traditional contexts, the combined use of data declarations, notifications, satellite and overhead imagery and on-site inspections has repeatedly been found to augment significantly the utility of the individual measures, particularly on-site inspections. 105/ Opportunities exist for synergies among verification methods, because of the potential cost benefits as well as enhanced effectiveness. 106/ There are also potentially valuable synergies among regional and global implementing organizations that deserve closer examination. 107/ There is already evidence that international verification organizations are in contact informally and exchanging information and experience. 108/ In the case of verifying United Nations sanctions, there is a need to supplement national activities by appropriate international and regional efforts.

223. Additional applications of verification data. Another lesson is that there may be benefits that result from sharing data collection resources or simply data with applications in non-disarmament fields, such as environmental ones. 109/ Practical experience in verification implementation in one field may also contribute to the development of verification measures in another. 110/

224. Cooperative data sharing. Recent experience suggests the need for more cooperative sharing, on a mutually agreed basis, of appropriate data from national or multinational technical sources. 111/

225. Data management. The need for effective data management systems to handle the increasingly complex and detailed information being reported, recorded, disseminated and analysed is another lesson amply demonstrated by recent experience. 112/ The value of data communications systems for arms limitation and confidence-building purposes as well as for exchanging verification data is

also indicated. 113/ Such data management and communication requirements suggest that some degree of centralized management or coordination by an international body may be needed.

226. Simplicity. Verification to be effective does not always require the most technologically advanced tools; commercially available equipment that is not necessarily at the cutting edge of technology may be quite adequate. 114/

227. Use of technology to reduce the manpower burden. Greater reliance on equipment may help to reduce human resources requirements, improve the efficiency of existing manpower and reduce intrusiveness. 115/ Related to this lesson is another that data from instrumentation that is used remotely must be protected from tampering and authenticated through the use of encryption codes.

228. Baseline data. The importance of having comprehensive baseline information as the foundation for subsequent verification activities is reinforced by recent experience, as is the importance of on-site inspections, including short-notice ones. 116/

229. Verification preparations. Experience suggests that, because verification is often a learning experience for implementers, there may need to be a start-up period before an agreement comes into force in order to allow for adequate preparations at both the national and the international level. 117/ A variety of diverse cases to date point to the value of joint verification experiments, research projects and equipment development, 118/ inspections by invitation and trial inspections, 119/ even before an agreement is signed. These mechanisms build confidence, assist in training and planning, encourage cooperative approaches and help refine verification procedures. Assistance in training and even financial assistance may be critical for effective participation by some parties in the verification process. 120/

230. Ad hoc verification in peace and security operations. Verification in most United Nations peace and security operations is, by necessity, established rapidly and in an ad hoc manner. This contrasts with traditional verification contexts where years may be spent in designing a specific verification arrangement. Peace settlements will usually delineate the verification objectives, but the methodology of verification will often be worked out on the ground. While collective memory and precedents have traditionally played a large role in determining the procedures to be followed in peace-keeping operations, recent experience suggests that more systematic advance attention to equipment, expertise and training may be warranted. The review by the Department of Peace-keeping Operations of the verification measures used to date in peace-keeping operations may facilitate the development, where appropriate, of verification "protocols". Such systemization could also help to ensure that parties to peace settlements are fully aware of the relevant verification requirements. Care must be taken, however, to ensure that the development of such general guidelines does not restrict the ability of United Nations peace-keepers to adapt their verification methods to the specific context in which they are operating.

231. Independence and impartiality. In the case of some verification activities by international bodies such as the United Nations, the need for an independent

capacity to collect, reduce and analyse data associated with verification requirements can be demonstrated. The advantages of a readily available multinational cadre of highly professional verifiers and technical experts are also shown in some contexts. 122/

232. Safety. Experience suggests the need to address adequately the health and safety of verification personnel when dealing with toxic substances or dangerous activities or when working in a hostile environment. 122/ This idea applies to both traditional and new contexts for verification. As much as possible, verification provisions should seek to minimize the risks to the health and safety of verification personnel. Moreover, responsibility for the health and safety of such personnel should be clearly spelled out in agreements.

233. Verification and implementation mechanisms. The utility of establishing a forum for addressing and resolving verification and compliance issues is another observation that emerges from recent experience in several cases. 123/ In order to facilitate implementation and avoid disputes that must be dealt with in such a forum, advance agreement on basic verification methods and procedures is critical 124/ or, in the case of peace-keeping operations, clarity in those portions of mandates dealing with verification. To achieve such agreement and help to ensure clear workable arrangements, recent experience reinforces the importance of involving at an early stage of the negotiations officials who will be responsible for implementing verification. 125/

234. Conclusion. In the coming years, new initiatives and activities in the areas of arms limitation and disarmament, confidence-building and conflict management are likely to continue apace. Assuring cost-effective verification will be a key issue in the implementation of multilateral, regional and local area agreements. In thinking through the design of verification regimes for future agreements, it will be important to draw on the lessons of past verification experiences as well as to reflect on the changes that are taking place in the world. The Group believes that examining the lessons from recent United Nations verification experiences and other international developments should lead to a better understanding of the full range of potential verification approaches and tools for future agreements.

B. Ideas for guidelines and principles

235. Guidelines and principles for involvement of the United Nations in verification continue to be important subjects for consideration. The Group of Experts has been requested, in paragraph 2 (b) of General Assembly resolution 48/68, to "Explore the further development of guidelines and principles for the involvement of the United Nations in verification". In fulfilling this mandate, the Group reviewed two documents in particular, which provide verification guidelines and principles adopted by the United Nations - the Final Document of the Tenth Special Session of the General Assembly, the first special session devoted to disarmament, 126/ and the Sixteen Verification Principles (1988), 127/ in the light of the lessons learned from recent United Nations verification experience and other relevant international developments.

236. The key ideas contained in the 1978 and 1988 principles have served the test of time well; they remain clear and appropriate guideposts, reflecting an international consensus on the main objectives and criteria for verification. The Group of Experts affirms the continued importance and applicability of the 1978 and 1988 principles.

237. Those principles, however, were developed primarily with respect to verification in the context of formal arms limitation and disarmament agreements and during a significantly different international security environment. The review of recent experiences and lessons drawn from them indicate that it is timely to explore whether and, if so, how the principles can be refined and further developed in order to ensure their continued relevance and utility. In carrying out this task, the Group is suggesting areas where additional principles might be appropriate and some possible formulations of them. In doing so, the Group has sought to develop ideas which both take into account the traditional arms limitation and disarmament context and the new contexts to which verification has relevance such as confidence-building and conflict management.

238. Even as the role for verification expands into new areas, it remains an essential component of the processes of arms limitation and disarmament. An examination of the existing principles both in the light of the changed international environment and in relation to new verification objectives will, it is to be hoped, contribute to the goal of effective verification in all relevant contexts.

239. No verification system can be expected to provide perfect assurance of compliance. This is as true today as it was in 1978 or 1988, when the earlier verification principles were drafted. Verification in both traditional and new contexts should be both effective and seen to be so. It should not generate a false sense of security.

240. The following ideas are offered as complementary or supplementary to the existing principles, not as replacements. Formulated in general terms, these ideas are applicable to the involvement of the United Nations in verification; they may also have relevance to other organizations beyond the United Nations. Use of the term "parties", rather than "States parties", reflects the increased application of verification and monitoring to situations of intra-State conflict.

241. The ideas are arranged into two broad categories: first, ideas relating to principles about the concept and general application of verification, and second, ideas about the management of verification. This arrangement is not intended to be definitive; some ideas may be relevant to both categories. The ideas are presented below in no order of priority.

1. Concept

242. Transparency. The expanding applications of verification in all its aspects places even greater emphasis on enhancing openness and transparency.

243. Early warning. The increased salience of the early warning function of verification should be recognized.

244. Neutral "third party". Neutral "third-party" verification, when requested by the parties, may be essential in certain contexts, particularly when the level of hostility among the parties is high.

245. Undeclared activities and facilities. Adequate and effective verification of arms limitation and disarmament obligations encompasses the requirement to verify, to the extent possible, the absence of undeclared activities and facilities, in addition to declared activities and facilities.

246. Abuse of verification. Care should be taken to prevent the abusive use of verification, and measures that could reduce this possibility should be carefully considered and deliberated during the negotiation of verification provisions, while recognizing that parties have an obligation to cooperate in an agreed verification process and to refrain from impairing, evading or interfering with verification.

247. Cross-fertilization of lessons. Lessons from verification in one context may have application in others.

2. Management

248. Verification means and ends. Verification means should be matched to verification ends; the choice of verification means should reflect the different basic purposes of verification: confidence-building, early warning, crisis management, maintaining, building, and/or restoring international peace and security.

249. Cost-effectiveness. Verification in all its aspects should endeavour to be cost-effective.

250. Synergies. In the design and implementation of verification arrangements, the multiplier effects of relationships among the methods utilized should be explored in order to improve verification effectiveness and make better use of limited resources.

251. Harmonization. Appropriate linkages and harmonization of verification efforts at the global, regional and subregional levels can enhance efforts at each level.

252. Pooling and common services. Pooling verification resources among the parties and utilizing common services should be seriously considered when designing verification arrangements.

253. Safety. The safety of personnel engaged in verification activities should be a fundamental concern of those responsible for the negotiation and implementation of verification arrangements.

254. Spillover of verification technology. Sensors, information-processing systems and communications systems designed and developed through arms control verification research have potential application in many areas of conflict management, confidence-building and disarmament.

255. Simplicity. Effective verification need not require the most technologically advanced tools or methodologies.

256. Additional applications of verification data. Verification technologies and data may have applications in other fields, such as environmental monitoring, and approaches could be developed which exploit such multiple uses.

257. Verification negotiations. It is advisable that officials who will be charged with implementing verification should be involved early in the negotiating process to help ensure that the methods and procedures adopted are as workable and efficient as possible.

258. Start-up period. Incorporating a start-up period before an agreement comes into effect will permit appropriate planning for verification, training of personnel and testing of procedures.

259. Cooperative preparations. The design and implementation of verification regimes can be facilitated by mutually accepted joint verification experiments, trial inspections and similar cooperative testing of verification methods, procedures and techniques.

260. Environmental protection. Verification methods, techniques and procedures should be implemented in a manner that avoids or, at the very least, minimizes adverse environmental consequences.

261. Assistance. Appropriate assistance, including training, to parties in developing national verification and compliance structures can greatly facilitate implementation of verification arrangements.

262. Baseline data. Establishing accurate baseline information upon which to base subsequent verification activities is critical for effective verification.

263. Cooperative data sharing. Mutually agreed sharing of appropriate data from national and multinational sources can contribute to the efficacy of verification.

264. Independence and impartiality. It is important for international verification organizations to have an independent and impartial capacity to collect, reduce and analyse data associated with verification requirements.

265. Verification and Implementation Mechanisms. Appropriate mechanisms should be established in order to ensure effective implementation of verification measures and to resolve ambiguities resulting from differing interpretations and possible false alarms.

VI. FUTURE ACTIVITIES BY THE UNITED NATIONS IN THE FIELD OF VERIFICATION IN ALL ITS ASPECTS

A. Introduction

266. An enhanced role for the United Nations in verification processes is already a reality. The present chapter seeks to examine future activities of the United Nations commensurate with its growing verification role. Particular attention is given to the ways in which a more robust verification capability can facilitate United Nations activities with respect to disarmament, confidence-building and conflict management processes.

B. Verification in the context of arms limitation and disarmament agreements

267. The direct role of the United Nations has thus far been minimal in relation to most treaty-specific verification activities. It is likely that the current segmented approach to implementation will continue for the foreseeable future. However, the Organization could play a valuable role in the future by providing assistance on request to parties to such agreements through its databases, exchanges, information centres, registers and training activities. It could also provide "common services" to Member States upon request through, for example, an imagery analysis centre, as outlined in paragraphs 307 and 308 below.

268. An important role for the United Nations could be to encourage linkages between the various verification and implementation bodies and to assist in the sharing of verification experience among countries. Such a facilitating and coordinating role by the United Nations seems much more achievable, given current fiscal and political constraints. 128/

269. Given the problems associated with the availability, complexity and cost associated with certain sophisticated Biological Weapons Convention verification technology, parties may wish to participate in an organization which undertakes, on their behalf, some of the analysis resulting from the collection of data associated with the Biological Weapons Convention. The United Nations may be called upon to assist Member States who are signatories to the Biologoical Weapons Convention in fulfilling their obligations under the Convention. The United Nations may also have a verification role under an amended Inhumane Weapons Convention.

C. Verification and confidence-building

270. In addition to being a channel for the exchange of information associated with global confidence-building measures such as the Register of Conventional Arms, the United Nations could serve as a forum for resolving concerns raised by the information exchanged under these measures, provided that differences of view on such a forum can be resolved. 129/ Also, there would seem to be an opportunity for the United Nations to facilitate complementary regional derivatives of global efforts for confidence-building measures. The United

Nations Regional Centres for Peace and Disarmament are already engaged in verification of confidence-building measures in appropriate circumstances, 130/ to the extent that limited financial resources will permit. The Secretary-General might consider a more active role in promoting the merits of the centres as an indispensable part of the Organization's preventive diplomacy efforts over the longer term. In specific cases of conflict management, including third-party monitoring of demilitarized or "thin-out" border zones, entry/exit points and troop withdrawals, the United Nations is particularly well placed to facilitate consideration of verifiable confidence-building measures in appropriate circumstances.

271. Regional arms limitations could be supported by confidence-building measures such as cooperative monitoring, limited aerial overflights and possibly inspections by invitation conducted by United Nations personnel.

272. The preamble to the Treaty on Open Skies explicitly refers to the possibility of employing overflights "to facilitate the monitoring of compliance with existing or future arms control agreements and to strengthen the capacity for conflict prevention and crisis management". There has been considerable interest in the use of this confidence-building measure because of its potential application to peace operations and regional stabilizing activities and because of the synergies inherent in combining monitoring from aircraft with ground- and space-based monitoring. The United Nations, in the light of its growing capacity to monitor regional situations on a systematic basis, should actively assess the potential for this confidence-building/verification measure in conflict-management situations.

D. Verification and conflict management

273. In the area of conflict management, the United Nations can be expected to continue to have a pre-eminent role, often on its own and sometimes in cooperation with regional organizations. The range of means employed by the United Nations for the maintenance of international peace and security (preventive diplomacy, peacemaking, peace-keeping, peace enforcement and peace-building) may involve efforts to control arms and military forces with a concomitant requirement for monitoring and verification of compliance. The assembly, control and disposal of weapons has been a central feature of most of the comprehensive peace settlements in which the United Nations has played a peace-keeping role. This practical disarmament process is termed "micro-disarmament". It occurs in the context of the conflicts with which the United Nations is dealing most often and involves the light weapons that are actually killing hundreds of thousands of people (A/50/60-S/1995/1, para. 60). The following analysis does not take into account the ongoing discussions on "An Agenda for Peace" and its "Supplement" within the General Assembly's Informal Open-ended Working Group on An Agenda for Peace.

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1. Preventive diplomacy

274. Preventive diplomacy, understood as action to prevent disputes from arising between parties, to prevent existing disputes from escalating into conflicts and to limit the spread of the latter when they occur, is an increasingly important dimension of United Nations activities. Early warning of potential crises is essential so that preventive measures might be undertaken, and the United Nations has already initiated steps to improve its capacity to monitor developing regional situations on a world-wide basis. While fact-finding missions will of necessity largely remain ad hoc in nature, a comprehensive monitoring capacity will facilitate both timely and appropriately tailored responses. Consideration should be given to the augmentation of the current Situation Centre to enable it to access, analyse and report on regional developments on a continuous basis and to include in its mandate the maintenance of baseline data for verification purposes.

2. Peacemaking, peace-keeping and peace-building

275. Peacemaking is diplomatic action to bring hostile parties to a negotiated agreement through peaceful means. In the new international context, exacerbated ethnic, religious, linguistic or other group interests represent sources of tension leading, when they take the form, inter alia, of aggressive nationalism or aggressive separatism, to open armed confrontation in an intra-State context. With the consent of the parties, the verification role of a neutral third party, in particular the United Nations or a major regional organization, could be valuable for restoring confidence between the parties involved. This role could take the form of fact-finding missions and related activities to, inter alia, ascertain the accuracy of declarations respecting the nature, deployments or activities of military forces. To be most effective, these measures have to be undertaken from the very beginning of the crisis.

276. Such measures, however, can make meaningful contributions to peacemaking only to the degree that they are credible; that is, they must be seen to address the concerns of the parties and they must be effectively implemented. Verification can be an essential ingredient in this process if it is able to provide credible evidence about compliance with obligations that are assumed during the peacemaking process or timely evidence of non-compliance so that breaches can be satisfactorily addressed.

277. Peace-keeping involves a wide, and growing, range of verification activities that are central to overall mission objectives, including supervising, monitoring and verifying the withdrawal of foreign forces and their non-return; monitoring the cessation of outside military assistance to parties; locating and confiscating weapons and military supplies; supervising the regrouping and relocation of military forces to designated cantonment areas and verifying the process of demobilization, arms limitation and arms reduction. Demanding new tasks include the monitoring of "safe" or "protected" areas. Verifying compliance with these obligations is essential to a successful operation, providing the credibility and confidence in the process to undertake further conflict resolution activities. Verification, of course, cannot alone ensure compliance.

278. Just as the verification of obligations to control arms may be important for short-term stabilization purposes, agreements to disarm, to demilitarize or to limit armaments and military forces in other ways can be an indispensable ingredient to success in the longer term. For such agreements to be credible, effective monitoring and verification of compliance is required. The United Nations may, upon request, provide such monitoring and could assist the parties involved in their monitoring activities in other instances.

279. Recent experience suggests that more focused attention should be paid to the disarmament dimension of peace and security operations including, inter alia, the verification aspects. The United Nations should better prepare itself for its increasing, and increasingly complex, verification tasks in peace operations by exploring how it might better standardize its verification procedures, including the development of a range of verification "protocols" outlining the verification methods applicable to particular objectives. This would aid in more precisely defining the relevant portions of the mission mandates and in ensuring the informed consent of the parties. Of course, flexibility and the exercise of professional judgement by peace-keepers in the context of the specific situation on the ground will continue to be central to the success of peace-keeping missions. It is the Group's belief that more precision in defining the verification objectives and methodologies, both in a generic sense and during the development of mission mandates, will provide a better context for the exercise of those judgements.

280. Efforts should also be directed at identifying ways to exploit more fully advances in technology, especially in the areas of communication and surveillance, and towards the development of better, and more standardized, training methods in relation to the techniques of arms control and force limitation (such as relocation, disarming, cantonment and demobilization). Consideration should be given to further improvements in agreed data collection and analysis from ground reconnaissance, overhead surveillance and information-processing systems, including greater means for independent sources of information and analysis.

3. Disarmament measures within the framework of peace enforcement

281. Disarmament, inspection, monitoring and verification procedures are playing an important role in the implementation of Security Council resolution 687 (1991) concerning Iraq. United Nations personnel have been directly involved in achieving important milestones regarding the implementation of disarmament measures and considerable experience has been gained in the mechanics of weapons inspection and disposal, particularly in relation to the mounting of complex multinational inspection teams on short notice and in the use of a number of mutually reinforcing verification methods in combination. While the disarmament and long-term monitoring regime, as mandated by the Security Council in its resolutions 687 (1991) and 715 (1991) is unique - and unlikely, it is hoped, to be repeated in its entirety elsewhere - care should be taken to ensure that the practical experience gained is not lost to the United Nations or the international community at large. A systematic collection and analysis of the Organization's verification experience, including in relation to

the implementation of resolution 687 (1991), should be undertaken as part of the broader effort by the United Nations to enhance its ability to implement the verification objectives of peace and security operations.

E. Linkages and synergies

282. In paragraph 2 (c) of General Assembly resolution 48/68 the Group of Experts was requested to consider ways that the United Nations might "facilitate verification through relevant procedures, processes and bodies for acquiring, integrating and analysing verification information from a variety of sources". The Group has interpreted this request to include an exploration of verification linkages and synergies.

283. Verification synergies involve the multiplier effects associated with the combination of separate verification elements. When combined, the total ability to verify is greater than the sum of the verification efforts taken separately. Recent experience has amply demonstrated that there are high-value synergies associated with the combination of technical means of verification, data exchanges, notifications and on-site inspections, and among disarmament and conflict management processes. 131/

284. The verification experience of the United Nations will be useful in the successful finalization of new consensus principles based on the ideas presented in chapter V of the present report. These principles could reflect the linkages among arms limitation, confidence-building and conflict-management processes.

1. Cooperative monitoring

285. With the increased emphasis on multilateral agreements and arrangements, greater attention is being paid to the concept of cooperative monitoring, in which inherent synergies and linkages can be exploited, both to enhance the effectiveness of verification and to reduce its costs. 132/ Cooperative monitoring involves the collection, analysis and sharing of information among parties to an agreement. 133/ Technologies incorporated into a cooperative monitoring regime must be capable of being shared among all parties, and all parties must receive equal access to data or information acquired by the system. Use of such technologies facilitates implementation of agreements by providing the capability to observe relevant activities, to define and measure agreed-upon parameters, to record and manage information and to carry out inspections using standardized monitoring systems that balance the ability of all parties to the agreement to detect and to analyse relevant information. Because it may be shared, the results of cooperative monitoring can have great utility in open discussions of compliance. It should be noted, however, that States that participate in cooperative monitoring arrangements generally retain the right to make compliance decisions themselves, using all available information, whether from shared technologies or national technical means. Cooperative monitoring should therefore be seen as a supplement to, not a replacement for, national capabilities.

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286. The cooperative acquisition of agreed-upon information using shareable technologies can involve a wide variety of activities of relevance to future activities of the United Nations in the field of verification. Some of the activities described below also represent new development in relation to the recommendations of the 1990 study.

(a) Information gathering

287. United Nations activities related to assisting the transfer of data among Member States - for example, the Register of Conventional Arms, the Standardized Military Budget Data Exchange, as well as agreement-specific activities such as those related to the Biological Weapons Convention confidence-building measures - are important examples of how the United Nations can facilitate transparency in military matters. Such transparency can in some contexts facilitate verification of compliance with specific obligations. The data exchanged may also form the basis for further activities in the field of verification. Throughout the Expert Group's deliberations, the important and close relationship between verification and transparency was made evident. It appears likely that United Nations efforts to promote transparency will continue. Regional organizations are also in various stages of consideration, or development, of similar activities.

288. Further dimensions to a United Nations role in the collection and exchange of verification-related information could prove useful particularly if information from a wide variety of sources were gathered and made available for dissemination in one place, accessible to Member States through data networks and other cooperative data access systems. Consideration would then have to be given to the development of a rapid, computerized retrieval system.

289. Member States with relevant experience in the field of verification should be urged to contribute to the United Nations databases. Many Member States have extant national data banks which could be incorporated into that of the United Nations. The usefulness of the United Nations data bank will be determined in large measure by the support it receives from Member States in providing as comprehensive, timely, authoritative and accessible data as possible.

290. Registers of experts with their qualifications and availability for verification inspections and operations could prove useful. A catalogue of their actual experiences in monitoring operations would be a valuable training aid for future inspectors. The questionnaire developed by UNIDIR in the first stage of its major study on the disarming of warring factions in the context of efforts to resolve an intra-State conflict is an important attempt in that direction, as is an effort begun by the Department of Peace-keeping Operations in early 1995 to begin to collect and collate the verification experience of United Nations peace-keepers.

291. The recently established United Nations Register of Conventional Arms has the potential in the longer term, particularly if its scope is expanded, to provide relevant data for future verification-related activities, as does the United Nations Standardized Reporting of Military Budgets, provided that continuing differences as to the direction and pace of expansion of the former, and as to the comparability of reported data with respect to the latter, can be

satisfactorily addressed. The current United Nations Situation Centre could also provide useful operational data, particularly if its mandate were extended to include the maintenance of baseline data for verification. 134/

292. To support its peace and security operations, the United Nations could establish a database of specific, potentially available capabilities in the field of verification broadly defined that Member States could provide for the full range of peace-keeping and humanitarian operations. This could include capabilities relevant to verifying obligations with respect to the control of arms in peace and security operations.

293. During the third session of the Ad Hoc Group of Governmental Experts established at the 1991 Conference of States Parties to the Biological and Toxins Weapons Conventions, in the course of an informal meeting, delegations had an opportunity to discuss the lessons learned from trial inspections carried out by certain States parties. Operational data associated with such exercises and similar types of verification experiences would be of value to all Member States, and the data might form the basis for United Nations activity in facilitating the sharing of this information.

294. Consideration could be given to the inclusion of an inventory of available data from national sources, including NTM; a catalogue of commercially available satellite, airborne and other technical data indexed by type, resolution, timeliness, sources, and cost; an inventory of sensors available for cooperative monitoring and their sources; and an inventory of available verification training aids, for example, manuals or courses, including their nature, type, application, availability and cost. Member States should be encouraged to provide information on their experiences with verification and confidence-building measures for the use of other countries contemplating such measures.

295. International cooperation to identify common problems and develop common solutions for implementing arms control obligations, especially prior to the coming into force of agreements, could be beneficial. In the CFE context, for example, there were a number of international efforts among the States parties to share experience in preparation for the implementation of the Treaty, including joint trial inspections and data exchanges. This process is ongoing in seminars and joint training courses. Similar efforts are beginning to occur as countries prepare for implementing the Chemical Weapons Convention, notably with respect to the establishment of "national authorities". Such international cooperation has proved advantageous for most participating countries, not just those with limited resources, and the United Nations is well placed to promote and facilitate these efforts.

296. In a world of often troubling complexity, exchanges between diplomats and experts become increasingly relevant and important. Moreover, exchanges among groups of scientific experts in different fields of problem-solving can produce synergistic effects leading to new solutions. Exchanges on implementation problems and solutions would be particularly helpful in such areas as techniques for resolving ambiguities and non-compliance concerns. Exchanges associated with important, unresolved proliferation problems would also be beneficial - for example, information-sharing on approaches for restraining the proliferation of ballistic missiles, advanced conventional weapons and land-mines. The United

Nations might consider establishing regular, perhaps annual, forums, seminars, or conferences for facilitating such exchanges.

(b) Cooperative verification technologies

297. Cooperative monitoring requires shareable technologies and methodologies which can provide useful information on a cost-effective basis. Many of the technologies developed to support cold-war objectives are neither export-controlled nor classified and are applicable to a broad spectrum of arms control and confidence-building applications. Examples include detection and assessment technologies, such as unattended ground sensor systems, aerial overflight systems and commercial satellite imaging systems; data security technologies, such as data authentication and tamper-indication systems; computer modelling and simulation capabilities; and data management, analysis and fusion systems. All these developments regarding database software and technologies could be assisted by the United Nations through the facilitation of information exchanges on the software. Expert seminars and training might be particularly helpful. Some specific examples, including their capabilities and possible verification applications, are examined further in annex II. Because aircraft and satellites figured prominently in the report of the 1990 study group, they are discussed below.

298. Aircraft. The use of aircraft with an appropriate mix of sensors in contexts that involve the monitoring of compliance with obligations intended to control arms and enhance transparency has evolved dramatically. 135/ The various types of available sensors and the quality of their information has markedly improved since the completion of the 1990 verification study. This powerful tool can be applied effectively for verifying negotiated arms limitation and disarmament agreements and in peace and security operations. Utilizing aircraft for monitoring is not a panacea, however. Nor should it be seen necessarily as a way of replacing large numbers of ground inspectors or peace-keepers. Rather, it is a method of making the work of these ground-based monitoring personnel more effective and, ultimately, of improving the overall cost-effectiveness of verification.

299. In the context of conflict management, the United Nations has relied in large measure on support from Member States, or from regional security organizations, for the provision of aircraft, crews and sensors. Another option, which to date has only been pursued to a limited extent by the United Nations (chiefly in relation to aircraft), is the leasing of commercially available aircraft, sensors and analysis capabilities.

300. Given the cost of developing or leasing and operating its own airborne monitoring capability, the most realistic approach for the United Nations in the foreseeable future may remain reliance on continued contributions from Member States for airborne monitoring activities. Without the ability to acquire and process data from airborne platforms, the overall effectiveness of United Nations operations and support in arms limitation and disarmament, conflict management and confidence-building activities may be seriously curtailed. Further options should therefore be developed to promote greater use of aircraft in peace and security operations, including the means to ensure availability of specialized aircraft and sensors from Member States.

301. Satellites. Since the 1990 report there have been a number of notable developments with regard to the potential utilization of data from satellites in verification.. Potential compliance-monitoring applications of satellite imagery are expanding. Despite its effectiveness, especially when used in combination with information and assisted by other means, including continuous ground monitoring, inspections and exchange visits, the very high costs of satellite surveillance limit its feasibility in most multilateral contexts. It remains a highly attractive verification tool, provided that financial and political barriers attendant on its wider use in multilateral contexts can be overcome.

302. There has been growing movement recently in some Western European countries to develop a multilateral satellite capability relevant to verification of arms limitation and disarmament obligations. Such interest by the Western European Union underlines the increasing recognition of the utility of this method. The contribution that such regionally based systems might make in providing information to the United Nations in the future is an area of research worth exploring.

303. The provision of verification-related information to the United Nations from national sources, including from national technical means, is another area that has seen some significant developments since 1990. Both the Secretary-General of the United Nations and the Director General of the IAEA have underlined the usefulness of such information, in appropriate circumstances, and have encouraged Member States to be more forthcoming in its provision. Member States should continue to be actively encouraged to provide such information, as well as other related, useful and appropriate data, including, inter alia, satellite data which could be used to confirm the information provided the United Nations on required space launch notifications under the 1975 Convention on Registration of Objects Launched into Outer Space. If this information is to be fully useful, however, issues of selectivity, confidentiality, political sensitivities and the requirement for in-house expertise in relation to data analysis will have to be addressed. The role that the United Nations might play through the development of a modest imagery analysis capability is explored below.

304. Consideration might also be given to the use of commercial satellite imagery when such data are useful. UNSCOM has usefully employed commercial satellite imagery data. Until recently, commercial satellites have generally proved of limited utility for verification purposes. This situation has already changed quite radically, as resolution and analysis techniques improve and as more commercial satellite imagery sources become available in a timely manner. Of course, unlike the provision of satellite data from Member States, the acquisition and analysis of commercial imagery could entail direct costs to the United Nations that would need to be carefully considered.

305. Satellite communications can be an invaluable asset for United Nations peace and security operations because they can provide direct links to United Nations operations and operators throughout the world. The commercial capabilities associated with satellite communications have improved vastly over the past five years, greatly increasing the amount, type and quality of information related to verification that can be transmitted in a timely manner. 136/

306. In the longer term, the United Nations could also become responsible for cooperative monitoring efforts aimed at providing timely warning of potential crises and conflicts. Cooperative space surveillance in the form of international or multilateral technical means would be an example of a technology supportive of cooperative monitoring and relevant for verification of non-proliferation agreements. Satellites are currently under development that will test new instruments designed to detect electromagnetic pulses produced by secret nuclear tests. An international technical means under the auspices of the United Nations would also promote increased transparency and global and regional stability and would have a range of potential applications in areas unrelated to the maintenance of international peace and security including, in particular, monitoring for environmental early-warning purposes. Such an undertaking, however, would have significant monetary and resource costs, which could limit its feasibility in the short, or even medium term.

(c) Imagery Analysis Centre

307. Isolated images from national or commercial satellites do not constitute a true satellite verification capability. An effective capability in this regard implies some minimum ability to reduce and analyse appropriately and independently the imagery received from various satellite sources. Because of the importance of data from satellites and aerial platforms to its current and future operations, the United Nations could consider establishing its own imagery analysis centre to service verification activities associated with conflict-management activities, confidence-building measures and multilateral arms limitation and disarmament agreements. Such a centre could assist in data reduction, processing and analysis as well as in training technicians and photo-interpreters from Member States. It could be used by a variety of organizations responsible for verification, including those within the United Nations system, 137/ as well as those outside it, 138/ on an as-required and, possibly, a cost-recovery basis. The centre could use commercial as well as nationally provided satellite imagery. Once established the centre could also be useful for interpreting aerial imagery as needed. The development of the centre would provide a basic capability that could support a wide variety of compliance-monitoring requirements of Member States and of the United Nations in its operational roles. 139/ Careful consideration should also be given to whether, and how, relevant technical analysis and database components developed as part of UNSCOM might facilitate the development of such a centre.

308. Such a proposal is not a new one. France, among others, put forward a similar idea in 1989 140/ and the 1990 study examined the concept without passing definitive judgement. A modest imagery analysis capability might offer the United Nations the most cost-effective means of exploiting satellite data for a variety of cooperative monitoring purposes.

(d) United Nations studies on cooperative monitoring

309. Proposals have recently been made for the eventual negotiation of politically binding agreements on global confidence-building measures or regional questions. 141/ To prepare for such negotiations, expert studies on the potential relevance of cooperative monitoring should be considered.

310. Such studies could explore, inter alia, the development of open-source information, a methodology which is both a verification tool and an important component of transparency. Open sources are useful and effective in providing information. 142/ However, concepts, doctrines and information organization capabilities need to be developed in order to use the wealth of available information in a cost-effective manner.

F. Future activities by the Conference on Disarmament

311. In resolution 48/68 the Experts Group was directed to, inter alia, consider future activities of the Conference on Disarmament in the field of verification. Conscious of the independence of that body and the sensitivity of topics under active negotiation, the Group is reticent to offer specific advice on the role of the Conference on Disarmament in verification, except to make the following general observations.

312. As the sole multilateral disarmament negotiating forum, the Conference on Disarmament will continue to be involved in detailed discussions on verification provisions for specific agreements. For example, the Conference on Disarmament is currently engaged in such verification discussions with respect to a comprehensive test-ban treaty and will likely soon begin such discussions with respect to a treaty banning the production of fissile material for nuclear weapons or other explosive devices ("cut-off" agreement).

313. In the context of such negotiations in the Conference on Disarmament on specific arms limitation and disarmament agreements, the ideas for possible verification principles and guidelines suggested in chapter V of the present report may be relevant.

314. The experience of the Conference of Disarmament in the negotiation of specific agreements may also support some of the conclusions of this Study Group, notably regarding ideas for possible verification principles and guidelines. In particular, the Ad Hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Events, a group established by the Conference on Disarmament in July 1976, has played a prominent role in the development of a potential verification regime for the comprehensive test-ban treaty. The Group of Scientific Experts is an important example of the value of technical and operational research into verification before an agreement is reached, or even before negotiations begin. It is also an example of international cooperation; its work in the seismic community can be seen as the beginning of the development of a cadre of professional verification experts in the context of the comprehensive test-ban treaty, as well as a demonstration of the advantage of pooling verification resources, the potential of synergies of verification with applications in other fields (for example, earthquake detection), the importance of including implementers early in the negotiating process and the utility of verification experiments.

VII. RECOMMENDATIONS AND CONCLUDING OBSERVATIONS

A. Introduction

315. As laid down in General Assembly resolution 48/68, the mandate of the Group of Experts was not just to examine verification as a process but to generate practical ideas for the enhancement of United Nations capabilities for verification in all its aspects with respect to disarmament, confidence-building and conflict management.

316. In the post-cold war environment, the United Nations has demonstrated its ability to be directly involved in a variety of verification activities. Its future role in the field of verification appears likely to be a mix of facilitation, coordination and implementation, varying greatly with the context. For this final chapter, the Group's recommendations concerning the role of the United Nations in the field of verification are organized into three general functional categories, recognizing that these categories are not mutually exclusive: 143/

- A facilitative/coordinating role among existing verification procedures and implementation bodies;

- A common services role - a particularly important kind of facilitation - involving the development of expertise within the United Nations upon which other organizations, other parts of the United Nations or Member States can draw to meet verification requirements;

- An operational role directed at specific obligations that require verification, for which the United Nations has responsibility.

Where implementation of a recommendation of the Group could involve significant resources, the Group has so indicated.

B. Facilitation/coordination

1. Exchange of verification knowledge and expertise

317. The Group of Experts has noted that informal lines of communication have developed among implementing bodies - for example, as far as chemical weapons are concerned, among OPCW/PTS for the Chemical Weapons Convention, IAEA and UNSCOM. While there are obvious and important differences between these bodies in scope as well as mandate, regular exchanges of views on technical, administrative, research and substantive issues have been helpful. Indeed, the IAEA experience was used by OPCW/PTS in devising the broad outline of the Verification Division's structure, the development of health and safety policy, inspection planning, information-handling procedures and the development of facility agreements. The Group has also noted that the Director of the OSCE Conflict Prevention Centre has requested United Nations assistance in establishing contacts with other implementing organizations.

318. The Group of Experts has concluded that the United Nations could play a valuable facilitative and coordinating role in assisting implementing bodies responsible for verification activities. Thus it recommends the following:

- The initiation, under the auspices of the Secretary-General, of a series of annual symposia or workshops, possibly in cooperation with regional or treaty-specific organizations, the aim of which would be to promote the exchange of verification knowledge and experience. The subject-matter for these symposia might include the further regional applications of concepts such as open skies or verification tools such as inter-State communications networks. In order to finance these activities, co-sponsorship by Member States could be sought;
- The encouragement and facilitation by the Secretary-General of the development of communication channels and other contacts among verification implementing organizations.

2. Encouragement of cooperative monitoring and verification experiments

319. The development of cooperative forms of verification can evolve both within and outside of formal treaty structures. Parties to agreements may join together to pool resources or to coordinate their verification activities among themselves. Cooperative monitoring for verification among parties to an agreement can involve the employment of a variety of different methods and techniques in order to acquire, process, collate and analyse all the information needed to ensure compliance with obligations. The Group recognizes that encouraging the sharing of technologies would involve those technologies that are not considered by Member States as restricted for national security purposes. 144/

320. The synergies associated with the combination of multiple independent sources of information make a cooperative monitoring system more effective and transparency more convincing. This is particularly true in the increasingly complex and extensive verification regimes associated with current and potential multilateral arms limitation and disarmament obligations. Therefore, the Group recommends the following:

- The United Nations should encourage research to compare the costs and benefits for multilateral verification of the provision of common verification services by international organizations, pooling verification resources among parties and other approaches;
- Recognizing that appropriate equipment may help to reduce human resources requirements, improve the capacity of existing verification resources and reduce intrusiveness, the United Nations should encourage the development and sharing by Member States of multi-use, multi-purpose, cost-effective cooperative verification methods, procedures and technologies, as well as training assistance in those methods, procedures and technologies. This sharing should serve to

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encourage greater access to verification technology among parties to agreements;

- Because the design and implementation of verification regimes can be greatly facilitated by joint verification experiments, trial inspections and similar cooperative testing of verification methods, procedures and technologies, the United Nations should encourage and, possibly, upon request and where appropriate resources and expertise exist, develop and implement such arrangements.

C. Common services

321. The Group concurs with the conclusion reached in the 1990 study that the development of an international verification system must be seen as an evolutionary process. The development of common services for other verification organizations can be seen as a step towards such a system.

1. Databases

322. The 1990 Study pointed to the role that can be played by the United Nations in data collection and exchange of verification-related information. The 1995 Group of Experts has concluded that expansion of that role would prove useful and desirable because it would facilitate the availability of relevant information to Member States that might not otherwise have such access; it would facilitate cross-fertilization of verification ideas in both operational and research contexts, and it would promote verification synergies. This is an area in which the United Nations has a demonstrated expertise and potential. Therefore, it recommends the following:

- The United Nations should continue its work to develop a database of bibliographic references relating to literature on verification for public, research and training purposes, drawing on contributions from Member States;

- The United Nations should develop, as required, other databases oriented towards specific operational requirements related to compliance monitoring, such as the Biological Weapons Convention confidence-building measures;

- In support of the United Nations operational activities, the Organization should develop registers of relevant verification data sources, methods, experts, organizations, and training courses, using information submitted by Member States, including maintenance by the Secretary-General of a specific roster of verification experts;

- Efforts should be undertaken to promote cooperation between the United Nations and regional organizations in the development of databases relating to verification;

- Member States should be encouraged to develop and share with the United Nations and with other Member States improved technologies and methods for data collection, reduction, analysis and organization, as well as efficient management information systems to handle the expanding volume of United Nations verification data becoming available from a variety of sources.

2. A United Nations Information, Training, and Analysis Centre

323. The United Nations would perform a valuable service by establishing a capability for acquiring, integrating and analysing information from a variety of sources to assist all Member States in accomplishing their individual responsibilities for verifying compliance with global and regional arms limitation, disarmament and confidence-building agreements. In addition, the Group believes that verification is a learning experience for implementers. Career patterns and opportunities for inspectors need to be enhanced, especially in specialized verification systems; training programmes are essential if each party is to be able to make authoritative compliance judgements. Also, such a capability could be used by the United Nations itself to help meet its own operational verification tasks. There are also distinct cost and other advantages in utilizing short-term contractors for particular tasks. In order to strengthen these aspects of the role of the United Nations with respect to verification, the Group of Experts recommends that the following actions be considered:

- The United Nations should establish a modest, operationally oriented information collection and analysis capability for the analysis of overhead imagery acquired for verification purposes associated with specific arms limitation and disarmament agreements, confidence-building measures and conflict-management activities. This facility might service both the United Nations and other international agencies on a cost-recovery basis. It would draw upon commercial imagery as well as imagery provided by Member States. In developing this capability, the United Nations would seek to achieve economies of scale and avoid duplication of effort with other verification organizations. Through such a capability, the United Nations would become a source for information regarding specific, potentially available verification capabilities accessible by Member States. It could provide for a full range of activities and operations. In addition, it could be utilized to provide training in verification methods and technologies for Member States, as requested;

- The United Nations should assign responsibility for verification information management to an existing division within the Organization, which would be responsible for a work programme to coordinate the development and operation of a United Nations information, training and analysis centre, as described above;

- The United Nations should develop standard operating procedures, forms and channels for the provision of verification-related information to the United Nations and its related organizations from national sources. Member States should be encouraged to share with the Organization the greatest possible amount of information relevant to its verification activities from their national sources in a usable form and in a timely fashion;

- The Secretary-General of the United Nations should consider the development of a training programme for "verification implementers". Such a programme could be instituted with assistance from Member States having the requisite expertise. Such an activity, over a period of time, could help in the development of a corps of independent, neutral "third-party" implementers. The provision of this service would also be a substantial contribution to the development of multinational professional verification expertise;

- By encouraging the active sharing of verification information, facilitating training and developing a basic imagery analysis capability, the United Nations could promote greater access by all parties to verification data and technology.

3. Expansion of existing agreed verification principles and guidelines

324. The United Nations is uniquely qualified to provide a forum for the discussion and elaboration of new consensus principles and guidelines on verification.

325. The Group reaffirms that the key ideas contained in the Final Document of the Tenth Special Session of the General Assembly, the first special session devoted to disarmament, and in the Disarmament Commission Principles of Verification have served the test of time well and that they remain clear and appropriate guideposts for those charged with negotiating or implementing verification arrangements. Having explored whether and, if so, how those principles can be expanded in the light of a significantly changed international security environment in which verifying obligations associated with arms limitation and disarmament, confidence-building and conflict management takes a variety of forms, the Group recommends that:

- An appropriate United Nations forum should consider expanding the existing agreed verification principles and guidelines, in accordance with the ideas discussed in chapter V of the present report and other relevant proposals as may be developed.

D. Role of the United Nations in neutral third-party verification

326. Through its conflict-prevention and management efforts, the United Nations is directly involved in a wide range of verification activities. In addition to such operational roles in the context of peace and security operations, it is also uniquely qualified to undertake a neutral "third-party" verification or

confidence-building role for global, regional, subregional and local agreements in situations where such a role is acceptable to all the parties. In order to facilitate the role of the United Nations in such operational capacities, the Group recommends that the following courses of action be considered:

- The United Nations should be prepared to provide assistance on request to parties negotiating and implementing verification regimes concerning obligations to control arms through its Regional Centres for Peace and Disarmament, reporting instruments, fact-finding and training activities, among others;

- The United Nations should explore how to better prepare and systematize verification in its preventive diplomacy, peacemaking, peace-keeping and peace-building activities, so that such arrangements can be undertaken rapidly and in a cost-effective manner. In addition to standard verification protocols, attention should also be paid to equipment and personnel expertise and training requirements;

- Efforts should also be made to develop more systematized procedures for the monitoring and enforcement of measures not involving force under Article 41 of the Charter (commonly called sanctions);

- The systematic collection and analysis of verification experience deriving from United Nations peace and security operations should be undertaken as part of the broader effort to improve the Organization's capacity in this area;

- The United Nations should explore the organizational, legal, technical and financial parameters relating to the leasing or purchase of commercial remote-sensing aircraft for its verification activities. Study of this subject should include the questions of processing, reducing, analysing and disseminating the data acquired through the use of aircraft, the role of assistance from Member States, as well as the possible sources of financing of such a capability. The future potential of unmanned aerial vehicles, given cost constraints and asymmetries in technical capabilities, warrants closer examination. 145/

327. The Group concurs with the conclusion reached by the 1990 Group of Experts that the development and launching of a United Nations satellite network would involve major investments, including the acquisition of relevant technology, expertise and an image analysis capability. The Group also notes that the 1990 study described a first step in this direction, consisting of organizing a clearing-house for data gathered from existing satellites, where training would also be offered in the field of photo-interpretation. This first step is considered, along with other recommendations above, in section C.2 above. The development of a basic imagery analysis capability offers the United Nations a cost-effective means of exploiting satellite data for a variety of cooperative monitoring purposes, where the Organization itself is engaged, or in facilitating such activities by Member States and other parties to verification arrangements.

E. Concluding observations

328. There is a strong imperative for the United Nations to discharge effectively the verification responsibilities that are increasingly a part of its role in the maintenance of international peace and security and to provide appropriate services to Member States in the field of verification in all its aspects. Modest steps, within the budgetary and political constraints currently facing the Organization, to enhance its verification role will have a positive impact on efforts by the international community to successfully implement disarmament treaties, to develop effective early-warning mechanisms for impending conflicts and to respond with appropriate strategies to manage and resolve conflicts that have occurred.

Notes

1/ General Assembly resolution S-10/2, paras. 31, 91 and 92.

2/ Study on the role of the United Nations in the field of verification (A/45/372) henceforth referred to as "the 1990 study".

3/ Resolution 48/68 was sponsored by 23 countries: Armenia, Australia, Austria, Brazil, Bulgaria, Cameroon, Canada, Costa Rica, Czech Republic, Finland, Hungary, India, Kenya, Mexico, New Zealand, Nigeria, Panama, Republic of Korea, Russian Federation, Singapore, Slovakia, Thailand and the former Yugoslav Republic of Macedonia.

4/ Resolution 48/68, para. 2 (c).

5/ Canada, in particular, made a major early contribution with the provision of extensive bibliographic information in the field of verification.

6/ On the basis of the confidence-building measures agreed in relation to the Biological Weapons Convention, the Centre for Disarmament Affairs has received and distributed information submitted by States parties as follows: in 1991, 46 States parties (BWC/CONF.III/2 and Add.1-3); in 1992, 36 States parties (DDA/4-92/BWIII and Add.1-4); in 1993, 40 States parties (ODA/9-93/BWIII and Add.1 and 2); in 1994, 40 States parties (CDA/16-94/BWIII and Add.1 and 2); and in 1995, 52 States parties (CDA/14-95/BW-III and Add.1 and 2).

7/ Resolution 35/148 of 12 December 1980 called for annual reporting of military expenditures to the Secretary-General. Paragraphs 147 to 151 of the 1990 study contain a brief history of the development of this mechanism. The Register of Conventional Arms was established pursuant to General Assembly resolution 46/36 L of 9 December 1991.

8/ See, for example, E. Laurence and H. Wulf, "Lessons from the First Year" in Developing the United Nations Register of Conventional Arms, Bradford Arms Register Studies No. 4, Department of Peace Studies, Bradford University, 1994, p. 44.

9/ See Official Records of the General Assembly, Forty-eighth Session, Supplement No. 1 (A/48/1) and ibid., Forty-ninth Session, Supplement No. 1 (A/49/1).

10/ As of August 1995, a total of 89 Member States had submitted data and information on weapons transfers for the calendar year 1993. In addition, 35 States submitted background information, including listings of military holdings from 29 States and data on procurement through national production from 17 States (see A/49/352).

11/ See Official Records of the General Assembly, Forty-eighth Session, Supplement No. 1 (A/48/1).

12/ In 1991: Confidence- and Security-Building Measures: From Europe to Other Regions, Vienna, Austria, February; Challenges to Multilateral Disarmament in the Post-Cold-War and Post-Gulf-War Period, Kyoto, Japan, May; United Nations Workshop on Disarmament and International Security, Mexico, July.

13/ In 1991: Regional Meeting on Confidence-Building Measures in the Asia-Pacific Region, Kathmandu, Nepal, 24-26 January; Regional Disarmament Workshop for Asia and the Pacific, Bandung, Indonesia, 28 January-1 February; Seminar on Confidence- and Security-Building Measures, Vienna, Austria, 25-27 February; Conference on Disarmament Issues, Kyoto, Japan, 27-30 May; Training Programme on Conflict Resolution, Crisis Prevention and Management and Confidence-Building among the States Members of ECCAS, Yaoundé, Cameroon, 17-21 June; Regional Disarmament Workshop for Latin America and the Caribbean, Mexico City, Mexico, 1-5 July. In 1992: Non-Proliferation and Confidence-Building Measures in Asia and the Pacific, Hiroshima, Japan, June; Disarmament and Security Issues in the Asia-Pacific Region, Shanghai, China, August; Seminar on Disarmament and Security in Africa, Cairo, Egypt, September. In 1993: National Security and Building of Confidence among Nations in the Asia-Pacific Region, Kathmandu, Nepal, February; International Seminar on Confidence- and Security-Building in Southern Africa in Windhoek, Namibia, February; Disarmament and National Security in an Interdependent World, Kyoto, Japan, April; United Nations Symposium on Regional Approaches to Confidence- and Security-Building Measures, June, Graz, Austria; Security, Disarmament and Confidence-Building in the CIS Context, Kiev, Ukraine, September. In 1994: Cooperation in the Maintenance of Peace and Security and Disarmament, Kathmandu, Nepal, 31 January-2 February; and the Second Conference on Disarmament Issues, Hiroshima, Japan, 24-27 May. In 1995: Regional Meeting on Openness, Disarmament and Assurances of Security, Kathmandu, Nepal, 13-15 February; Standing Advisory Committee on Security Questions in Central Africa, Brazzaville, Congo, 20-24 March; Seminar on Arms Register for Central Africa, Brazzaville, Congo, 25 March; Regional Conference on Disarmament Issues: Efforts in the Last Half Century and Their Future Prospects, Nagasaki, Japan, 12-16 June; Subregional Meeting on North Asia Regional Dialogue, Kanazawa, Japan, 22-24 June.

14/ Mikhail Kokeyev and Andrei Androsov, Verification: the Soviet stance, its past, present and future (Geneva, 1990). (United Nations publication, Sales No. GV.E.90.0.6.)

15/ Serge Sur, ed. Verification of current disarmament and arms limitation agreements: ways, means and practices (London, Dartmouth, 1991). (In French: United Nations publication, Sales No. GV.F.91.0.9.)

16/ Allan V. Banner; Andrew J. Young and Keith W. Hall, Aerial reconnaissance for verification of arms limitation agreements: an introduction (New York, 1990). (United Nations publication, Sales No. GV.E.90.0.11.); Stanislav Rodinov, Technical problems in the verification of a ban on space weapons, UNIDIR Research Paper No. 17, June 1993 (United Nations publication, Sales No. GV.E.93.0.12).

17/ A neutral "third party" is an impartial actor not involved in the conflict, which assists in verification with the consent of the parties. A neutral third party can include an international organization (such as the United Nations), a regional organization, a group of countries or an individual country.

18/ See: Status of Multilateral Arms Regulation and Disarmament Agreements, fourth edition: 1992, vol. 2, pp. 113-282.

19/ Article XXI of the Convention reads as follows:

> "(1) This Convention shall enter into force 180 days after the date of deposit of the sixty-fifth instrument of ratification, but in no case earlier than two years after its opening for signature."

20/ As of 21 July 1995 there have been 32 ratifications of the Conventions.

21/ For example, monitoring efforts in Iraq pursuant to Security Council resolution 687 (1991), and relevant IAEA activities in relation to the Democratic People's Republic of Korea.

22/ See annex I for additional information.

23/ As of 31 December 1994, there were 170 facilities containing 207 power reactors, 156 facilities containing 167 research reactors and critical assemblies and 188 other nuclear facilities under IAEA safeguards or containing safeguarded nuclear material. There were also 327 locations outside facilities containing small amounts of safeguarded material and two safeguarded non-nuclear installations. In 1994, IAEA safeguards activities gave rise to 2,343 inspections. Over 60 countries have a significant nuclear fuel cycle under safeguard agreements with IAEA.

24/ INFCIRC/53 (Corr.), 1970, para. 73.

25/ GC (XXXVI)/1017.

26/ See submission by Dr. Bruno Pellaud, document of the Study Group SVG/CRP.13.

27/ It should be noted that these were activities involving the implementation of safeguards on declared materials and facilities and thus were distinct from the requested special inspection in connection with the possible existence of undeclared nuclear material.

28/ Environmental monitoring is used in the nuclear area to detect traces of radioactive materials from samples swiped from buildings and collected from vegetation, the soil and water sources. It was first used by IAEA in its inspections in Iraq and later in the Democratic People's Republic of Korea to detect the possibility of undeclared nuclear activities.

29/ The text of the Protocol is reproduced in The United Nations Disarmament Yearbook, vol. 17: 1992, pp. 328-330.

30/ The implementing agreements followed Umbrella Agreements signed by the United States with the Russian Federation (July 1992); Belarus (October 1992); Ukraine (October 1993); and Kazakstan (December 1993). The formal title of the Nunn-Lugar Act is the Soviet Nuclear Threat Reduction Act of 1991 (PL 102-228). The Act, inter alia, is intended to finance assistance in the Russian Federation and other CIS countries for programmes for the elimination, safe and secure transportation and storage of nuclear, chemical and other weapons and delivery vehicles; the safe and secure storage of fissile materials; the expansion of military-to-military and defence contacts; the demilitarization of defence industries and conversion of military technology and capabilities into civilian activities; and the environmental restoration of former sites and installations of weapons of mass destruction.

31/ As the term is used here, transparency may be defined as both a process and a product. The process of transparency is increased openness through cooperative and, ideally, reciprocal measures; the product is greater access to, and information regarding, relevant military security activities or weapons-related facilities, materials and activities. Transparency measures may be unilateral, bilateral, regional or multilateral.

32/ See the submission provided by Ian Kenyon, document of the Study Group (SVG/CRP.7).

33/ DDA/20-87/BW; DDA/20-87/BW/1 and Add.1-3; DDA/16-88/BW and Add.1-3; BWC/Conf.III/2 and Add.1-3; DDA/4-92/BWIII and Add.1-4; ODA/9-93/BWIII and Add.1 and 2; CDA/16-94/BWII and Add.1 and 2; CDA/14-95/BW-III and Add.1 and 2.

34/ BWC/CONF.III/VEREX/9 and Corr.1.

35/ Para. 38 of the Final Declaration (BWC/SPCONF/1, part II).

36/ The CFE Treaty was opened for signature on 19 November 1990 and entered into force on 9 November 1992.

37/ The CFE 1A Agreement signed at Helsinki CSCE Summit, 10 July 1992, inter alia, set limits on the number of military personnel permitted to specific national thresholds.

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38/ See the presentation by Mr. Necil Nedimoglu (SVG/CRP.14). It is important to emphasize that NATO's Verification Implementation and Coordination Staff is not mandated to implement the CFE Treaty or its verification components as IAEA does with respect to the non-proliferation Treaty; rather, it assists in coordinating national verification aspects.

39/ Experts involved in CFE verification have cited the utility of the UNSCOM experience in regard to coordinating multinational teams.

40/ The 1990 study has already mentioned that the Secretary-General's fact-finding mandate could be extended to cover the Inhumane Weapons Convention (see para. 27 above).

41/ CCW/CONF.I/GE.23.

42/ General Assembly resolution 46/59, annex.

43/ Ibid., para. 6.

44/ Ibid., paras. 28 and 29. In the Declaration, the General Assembly also stipulates that:

> "The Secretary-General should pay special attention to using the United Nations fact-finding capabilities at an early stage in order to contribute to the preventing of disputes and situations;
>
> "The Secretary-General, on his own initiative or at the request of the States concerned, should consider undertaking a fact-finding mission when a dispute or a situation exists;
>
> "The Secretary-General should prepare and update lists of experts in various fields who would be available for fact-finding missions. He should also maintain and develop, within the existing resources, capabilities for monitoring emergency fact-finding missions." (paras. 12-14)

In addition, the General Assembly, in its resolution 47/120 A of 18 December 1992, further emphasized the importance of the role of the Secretary-General regarding early warning and fact-finding. Thus, in part II of the resolution, the Assembly:

> "*Encourages* the Secretary-General to set up an adequate early-warning mechanism for situations which are likely to endanger the maintenance of international peace and security, in close cooperation with Member States and United Nations agencies, as well as regional arrangements and organizations as appropriate, making use of the information available to these organizations and/or received from Member States, and to keep Member States informed of the mechanism established;
>
> "*Invites* the Secretary-General to strengthen the capacity of the Secretariat for the collection of information and analysis to serve better the early-warning needs of the Organization and, to that end, encourages the Secretary-General to ensure that staff members receive proper training

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> in all aspects of preventive diplomacy, including the collection and analysis of information". (paras. 1 and 2)

And in part III of the same resolution the Assembly:

> "Recommends to the Secretary-General that he should continue to utilize the services of eminent and qualified experts in fact-finding and other missions, selected on as wide a geographical basis as possible, taking into account candidates with the highest standards of efficiency, competence and integrity;
>
> "Invites the Secretary-General to continue to dispatch fact-finding and other missions in a timely manner in order to assist him in the proper discharge of his functions under the Charter of the United Nations". (paras. 2 and 5)

45/ Official Records of the General Assembly, Forty-eighth Session, Supplement No. 1 (A/48/1).

46/ Ibid., paras. 279-281.

47/ See ibid., Forty-ninth Session, Supplement No. 1 (A/49/1), paras. 437-706.

48/ S/PRST/1995/9, p. 1.

49/ These guidelines were adopted by the General Assembly in its resolution 43/78 H of 7 December 1988. Paragraph 2.3.3 of the guidelines reads in part: "Confidence-building is a step-by-step process. ... At each stage of this process States must be able to measure and assess results achieved. Verification of compliance with agreed provisions should be a continuing process."

50/ See Official Records of the General Assembly, Forty-seventh Session, Supplement No. 42 (A/47/42), annex.

51/ In 1994, the Secretary-General issued the following reports on military expenditures in standardized form, as well as replies from Member States: A/49/190 and Corr.1 and Add.1-3 and Add.3/Corr.1; A/49/225; A/49/210 and Add.1.

52/ The 1975 Helsinki Final Document contains texts on confidence-building measures and certain aspects of security and disarmament.

53/ CPC Study Group document SVG/CRP.16.

54/ CPC Study Group document SVG/CRP.21.

55/ The Treaty on Open Skies was opened for signature at Helsinki on 27 March 1992; depositary Governments: Canada and Hungary. See Status of Multilateral Arms Regulation and Disarmament Agreements, Fourth Edition: 1992, vol. 2 (United Nations publication, Sales No. 93.IX.1 (vol. 2)), p. 5.

56/ A/46/463, annex, and CD/1126.

57/ "Procedures for the Establishment of a Firm and Lasting Peace in Central America", 7 August 1987; see S/19085, annex.

58/ The development of confidence-building measures owes much to the events in the Middle East, in particular the Camp David Accords, which led ultimately to the setting up of the multinational forces and observers, currently operating in the Sinai.

59/ The Working Group is chaired by the United States and the Russian Federation. Extraregional States serve as "mentors" on the specific proposals for confidence-building measures. The Netherlands serves as mentor for the work on the communications network; Turkey serves as mentor on information exchange; Canada serves as mentor on maritime cooperation; and Australia is coordinating work in relation to the development of the regional security centres.

60/ See ASEAN Regional Forum Chairman's statement of 25 July 1994; BBC Summary of World Broadcasts, 28 July 1994, part 3 - Asia: FE/2059/B.

61/ General Assembly resolution 47/53 B of 9 December 1992.

62/ See A/48/403; this term is in current usage at the United Nations but does not represent official terminology.

63/ United Nations peace forces in the former Yugoslavia.

64/ The concept of protected areas has been used in Croatia; see Security Council resolution 743 (1992).

65/ On the basis of Security Council resolution 824 (1993), the Council decided that the capital of the Republic of Bosnia and Herzegovina, Sarajevo, and other such threatened areas, in particular the towns of Tuzla, Zepa, Gorazde, Bihac and Srebrenica, should be treated as safe areas.

66/ In the case of Rwanda the Security Council established secure humanitarian areas; see Council resolution 965 (1994).

67/ In its resolution 795 (1992), the Security Council authorized the Secretary-General to establish an UNPROFOR presence in the former Yugoslav Republic of Macedonia.

68/ See A/50/60 and S/PRST/1995/9.

69/ Security Council resolution 724 (1991).

70/ Security Council resolutions 787 (1992) and 820 (1993).

71/ South Africa - Security Council resolution 421 (1977); Libyan Arab Jamahiriya resolution 883 (1993); Angola - resolution 864 (1993).

72/ Haiti - Security Council resolution 841 (1993); Angola - resolution 864 (1993).

73/ Libyan Arab Jamahiriya - Security Council resolution 748 (1992); Iraq - resolution 687 (1991); Haiti - resolution 841 (1993).

74/ The IAEA inspections have uncovered three clandestine uranium enrichment programmes: electromagnetic, centrifuge and chemical isotope separation; as well as laboratory-scale plutonium separation. The sixth nuclear inspection uncovered conclusive evidence of a nuclear-weapons development programme aimed at an implosion-type nuclear weapon, possibly linked to a surface-to-surface missile project.

75/ The IAEA teams ordered and supervised the destruction of over 1,900 individual items as well as 600 tons of specialty alloys useful in a nuclear weapons programme or in enrichment activities. At nuclear-dedicated sites, specialized process buildings covering a surface area of some 32,500 square metres were demolished with explosives, also entailing the destruction of a large amount of high-quality equipment which had been installed or stored at those sites. With the completion of the "destruction, removal and rendering harmless" activities to date, IAEA is confident that there remain no practical capabilities in Iraq for the production of nuclear weapons or of nuclear-weapons-usable material (i.e., highly enriched uranium or plutonium). Highly enriched uranium in the form of reactor fuel elements and a few grammes of separated plutonium were removed from Iraq under IAEA oversight.

76/ At the end of the Gulf conflict, Iraq had declared, as stocks remaining, over 500 tons of bulk agent, 28,000 munitions and some 4,000 tons of precursors. Those items which were judged safe to move were transported to a central location for destruction, while the remainder was destroyed on site by UNSCOM. In the field of ballistic missiles, UNSCOM inspection teams have supervised the destruction of 151 missiles, plus launchers and related equipment.

77/ United Nations Special Commission information note, March 1994.

78/ Interview with UNSCOM personnel, May 1994.

79/ The U-2 aircraft, provided by the United States, uses two types of sensors, a "sweeping camera" and a high-resolution camera and is reportedly the first reconnaissance system to be placed under full-time United Nations control. The three German-supplied helicopters regularly fly with an aerial inspection team on board, using both hand-held and gyroscopically stabilized photographic equipment with the capability of providing a ground resolution in millimetres. Helicopters were also used to deploy ground-penetrating radar for the purpose of identifying cavities, metal and wires buried underground. Other helicopters used forward-looking infrared radar to provide a night-vision capability for the immediate securing of an intended inspection site and gamma-detection equipment in order to identify nuclear-radiation hot spots or emissions that could be checked out by ground teams.

80/ Security Council resolution 715 (1991).

81/ Recent experience in verifying arms control obligations in the context of peace-keeping operations, suggests that there may be a tendency with detrimental effects to bypass, rather than adapt, approaches which have proved effective in more traditional contexts. This tendency may result in imprecise mandates, lack of proper equipment, lack of training and lack of a complete understanding by the parties themselves of the obligations they have assumed.

82/ The verification experiences associated with the implementation of the INF and CFE provisions have clearly been of importance in the development of subsequent multilateral verification regimes.

83/ For example, in the experience of the Biological Weapons Convention. An evolution has also taken place with respect to the CFE Treaty verification regime.

84/ See the OSCE example in particular.

85/ See the OSCE and CFE examples. The operation of such an evolutionary process seems to be the hope with respect to the Middle East peace process, South Asia and other regional cases.

86/ Note, for example, the emphasis placed on enhanced transparency in current IAEA efforts to strengthen the safeguards system. It has become especially clear that greater openness and transparency on the part of States with regard to their nuclear activities are crucial to the optimum effectiveness of safeguards implementation. It has also become apparent that if data about such activities from all sources available to the Agency are more systematically collected and evaluated, they can help better equip the safeguards system to provide assurance about compliance with safeguards and non-proliferation. Note also the beneficial effects of increased East/West transparency for cooperative verification activities between the Russian Federation and the United States and between NATO and the Central and Eastern European States.

87/ See for example: INF, START I and II, other bilateral Russian Federation/United States experience. CFE, OSCE, Conventional Arms Register, the United Nations standardized military budgets and the United Nations Principles on Objective Military Information.

88/ This was the case for the IAEA verification activities with respect to the South African nuclear-weapons programme.

89/ See for example, START I and II and other bilateral Russian Federation/United States experience.

90/ See for example: the UNSCOM/IAEA activities in Iraq, and the IAEA "Programme 93+2".

91/ Several arms limitation and disarmament agreements seek to address this question through the use of challenge inspection provisions and other measures.

92/ Challenge and short-notice inspections imply enhanced openness.

93/ The Chemical Weapons Convention is clearly an example on a global basis of the development of a non-discriminatory arms limitation and disarmament agreement: its ban on chemical weapons possession, production and use applies equally to all States parties. The multilateral comprehensive test-ban treaty and cut-off agreements will also probably need to be non-discriminatory in the scope of their limitations and their verification regimes if they are to achieve their objectives.

94/ For example, in the CFE quotas of inspections based on the quantity of military equipment and facilities possessed will lead to unequal numbers of inspections liabilities among States. In this case, applying the same criteria for determination of quotas results in different inspection burdens among States.

95/ The handling of confidential information in the IAEA safeguards and in the Chemical Weapons Convention are examples. The development of verification procedures in the bilateral Russian Federation/United States contexts, which both confirm compliance and protect sensitive weapons design, may have important lessons for other agreements.

96/ See for example: the UNSCOM/IAEA activities in Iraq and IAEA safeguards.

97/ See for example, the INF Treaty and the Chemical Weapons Convention. An example of what is meant by this lesson would be the care that should be exercised to ensure that the verified destruction of weapons should not cause harm to the natural environment of the State on which the destruction takes place or to other States. As a general rule, the agreement should specifically require observance of an appropriate standard of "environmental care".

98/ This is the case in many United Nations peace-keeping operation contexts. See also the Middle East peace process.

99/ Indeed, the need to compensate for asymmetries in capabilities of States in this field was noted by the 1990 Study Group, which, inter alia, suggested that the United Nations could, on request, explore ways to provide expert advice to States contemplating the establishment of verification structures. The 1990 Group also advocated an enhanced role for the United Nations Secretary-General in certain fact-finding activities.

100/ This trend is suggested, among other cases, by the fact that the unilateral elimination of all Soviet/Russian and United States surface-launched theatre nuclear weapons and the reciprocal bilateral disarmament agreements announced by Presidents Bush, Gorbachev, and Yeltsin were implemented with no agreed-upon verification procedures. In certain circumstances, national means of verification are coming to be seen as sufficient when combined with a general atmosphere of increased transparency.

101/ For example, the CFE Treaty verification regime as originally designed.

102/ This is suggested strongly by the CFE experience and the role assumed by NATO's VICS. See also the discussion regarding the need for sharing United Nations sanctions monitoring costs.

103/ The Open Skies Treaty, for example, involves some parties cooperating in developing shared equipment for surveillance aircraft. In the CFE context, NATO countries cooperated in developing multinational inspection teams, which later evolved to include other parties to the Treaty. The Ad Hoc Group of Scientific Experts discussed in chapter VI is another example of the advantages of pooling verification resources, in this case regarding research. United Nations peace-keeping operations reflect the ad hoc pooling by the international community of a wide variety of military forces and equipment.

104/ The key example here is the CFE experience where the absence of such a body in the Treaty provisions has led NATO's VICS gradually to assume data management, inspection coordination and training functions on behalf of all the parties, in an ad hoc fashion.

105/ This is suggested by the Biological Weapons Convention VEREX report, which indicated that the highest-synergy potential seemed to be between data declarations and on-site inspections. This echoes lessons from other examples, that basic data exchanges form the crucial foundation upon which subsequent verification activities occur.

106/ The "multi-method" verification package employed by UNSCOM is a classic example of a multi-method verification package. While the long-term monitoring programme being put in place pursuant to General Assembly resolution 687 (1991) is unique in its scope and intrusiveness, it is possible that some of the techniques and methods utilized in the programme may be relevant to ongoing efforts to develop a multilateral regime governing the transfer for peaceful purposes of sensitive dual-use technologies. The 1992 Vienna Document has demonstrated the use of a variety of verification methods to confirm compliance. The Sinai disengagement process also made use of a multi-method process of verification, as does the multinational force and observers (see also the discussion of the Biological Weapons Convention VEREX).

107/ With the increase in regional organizations engaged in verification activities and the prospect of several international verification authorities, serious attention should be paid to the harmonization of potentially overlapping and complementary activities among global, regional and subregional organizations in order to maximize effectiveness and minimize both the costs and the disruptions associated with verification. The most striking example is in the area of nuclear safeguards where IAEA safeguards, regional agreements such as the Treaty of Tlatelolco and the Euratom Treaty and bilateral accords such as that between Argentina and Brazil work in a complementary fashion. In his recent position paper entitled "Supplement to an Agenda for Peace" (A/50/60-S/1995/1) the Secretary-General outlined several principles relating to the coordination of efforts by regional organizations and the United Nations in the area of peace-keeping and peacemaking, which could also have application in verification contexts.

108/ This point was made in briefings by Ambassador R. Ekeus (Study Group document SVG/CRP.12) and Mr. Bruno Pellaud (Study Group document SVG/CRP.13) regarding links between the Chemical Weapons Convention, IAEA and UNSCOM. Also, the CSCE CPC has asked the United Nations to assist in making contacts (see its submission, Study Group document SVG/CRP.21).

109/ Examples of potential additional application of verification technology include seismic monitoring of a nuclear test ban treaty which could have relevance for geophysical research (such as through the work of the Group of Scientific Experts discussed in chap. VI) and the use of verification or confidence-building overflight regimes to aid in environmental monitoring. Hungary has found data from overflights under its bilateral Open Skies Agreement with Romania to be of use for pollution control. Opportunities for the additional application of verification measures may be significant in the area of BW, because of the considerable overlap of civilian and military expertise. Certain types of United Nations peace operations may also involve verification tasks that could address both military security and environmental or land use applications. Such efforts at additional applications should be undertaken in a manner which does not reduce the effectiveness of the technology in accomplishing its primary verification mission.

110/ Practical experience in the implementation of the Chemical Weapons Convention may contribute to the development of verification measures for the Biological Weapons Convention. In this regard it should be noted that, given the overlap (i.e. in the area of toxins) between the two Conventions, cooperative techniques should be explored with a view to promoting cost-effectiveness and reducing the potential for unnecessary duplication of effort. See also the UNSCOM/IAEA experience in Iraq, which has been described as a "laboratory" for verification methods.

111/ Donated overhead imagery has been used by UNSCOM and IAEA inspection teams in Iraq, and by IAEA with regard to the Democratic People's Republic of Korea as a supplement to other verification activities.

112/ See, for example, the INF and CFE treaties. This need will only increase with the implementation of complex agreements such as START I and II and the Chemical Weapons Convention. The need for better and more systematic collection and analysis of information is also indicated in the context of peace operations and sanctions monitoring.

113/ Bilateral hotlines or data lines and the OSCE communications network point to this.

114/ See, for example, the submission by Dr. Arian Pregenzer (Study Group document SVG/CRP.28). The experience of UNSCOM in some respects echoes this lesson.

115/ See in particular recent IAEA verification experience.

116/ See, for example, the experience of UNSCOM and IAEA with respect to Iraq, as well as the INF and CFE treaties.

117/ See, for example, the CFE Treaty as well as the Chemical Weapons Convention. The INF Treaty experience similarly demonstrated the need to build flexibility into the implementation process in order to provide sufficient time to prepare for treaty implementation. It also indicated that there was a need in advance to carefully evaluate time-lines in reference to the human resource and equipment requirements needed to implement treaty provisions.

118/ See, for example, the START I and CFE experiences. In the bilateral United States/Russian Federation context, the cooperative development of technological equipment such as fissile material containers and flexible armour blankets, the provision of design assistance and construction of fissile material storage facilities and the development of enhanced fissile material control and accounting procedures will aid in the safe dismantlement of nuclear weapons in the former Soviet Union. These procedures and technologies could be utilized for dismantlement and secure storage of such weapons in other areas of the world. As discussed in chapter VI, the Ad Hoc Group of Scientific Experts represents an important example of the value of technical and operational research into verification before an agreement is reached to limit arms, or even before negotiations begin. The Group is also an example of how international cooperation can be built through verification research.

119/ See, for example, the CFE Treaty. START I and II, the Chemical Weapons Convention, OSCE, and the Open Skies Treaty. See also the Ad Hoc Experts Group discussed in chapter VI. The Netherlands, Canada and the United Kingdom have engaged in a series of practice inspections of industrial sites in order to provide useful data and experience for the Biological Weapons Convention negotiations on the level of confidence in verification procedures which, might be achieved in certain circumstances.

120/ The experience of the CFE Treaty, OSCE, the Chemical Weapons Convention and of some bilateral Russian Federation/United States agreements highlight the importance of providing assistance to countries in developing such national verification and implementation structures. The same can be said regarding many confidence-building agreements. Indeed, provision of such assistance can serve a useful confidence-building role in itself. In the context of peace and security operations, assisting the parties in developing their own national verification and compliance structures can form an integral part of a post-conflict peace-building strategy. Asymmetries in the ability of parties to establish national systems for verification and implementation was a subject of attention in the 1990 Study. Indeed, two of its recommendations (regarding the United Nations database and the promotion of exchanges between experts and diplomats) were, in part, intended to address this problem.

121/ See, for example, the UNSCOM experience in Iraq as well as the discussion of peace and security operations. See also the submissions to the United Nations Verification Group by Mr. Peter von Butler; Study Group document SVG/CRP.5; the submission of Dr. Bruno Pellaud in Study Group document SVG/CRP.13; and CSCE/CPC Study Group document SVG/CRP.16. The Ad Hoc Experts Group discussed in chapter VI can also be seen as an example in this context.

122/ OPCW verifiers working in the area of chemical weapons, for example, will encounter special health and safety risks. Similarly, verifiers in United Nations peace-keeping operations will encounter risks because of tensions inherent in the context in which verification activities are occurring. See also: UNSCOM, IAEA safeguards and CFE.

123/ See, for example, the CFE and bilateral Russian Federation/United States agreements. In peace and security operations in addition to the Security Council, appropriate procedures, forums or bodies are often established locally among the parties to discuss such issues.

124/ See, for example, bilateral Russian Federation/United States agreements and the CFE.

125/ The benefits of involving implementers in the negotiating process were evident in the INF, START I and II, CFE and CSCE, the Chemical Weapons Convention, the Open Skies Treaty and the Ad Hoc Group of Scientific Experts discussed in chapter VI. This lesson may have particular relevance in the context of United Nations peace and security operations where the parties themselves may not be directly involved in elaborating the specific verification provisions and therefore have to rely on the implementers for appropriate guidance.

126/ General Assembly resolution S-10/2. The relevant paragraphs read as follows:

> "Disarmament and arms limitation agreements should provide for adequate measures of verification satisfactory to all parties concerned in order to create the necessary confidence and ensure that they are being observed by all parties. The form and modalities of the verification to be provided for in any specific agreement depend upon and should be determined by the purposes, scope and nature of the agreement. Agreements should provide for the participation of parties directly or through the United Nations system in the verification process. Where appropriate, a combination of several methods of verification as well as other compliance procedures should be employed." (para. 31)
>
> ...
>
> "In order to facilitate the conclusion and effective implementation of disarmament agreements and to create confidence, States should accept appropriate provisions for verification in such agreements. (para. 91)
>
> "In the context of international disarmament negotiations, the problem of verification should be further examined and adequate methods and procedures in this field be considered. Every effort should be made to develop appropriate methods and procedures which are non-discriminatory and which do not unduly interfere with the internal affairs of other States or jeopardize their economic and social development." (para. 92)

127/ See Official Records of the General Assembly, Fifteenth Special Session, Supplement No. 3 (A/S-15/3), para. 60. The 16 principles are:

"(1) Adequate and effective verification is an essential element of all arms limitation and disarmament agreements.

"(2) Verification is not an aim in itself, but an essential element in the process of achieving arms limitation and disarmament agreements.

"(3) Verification should promote the implementation of arms limitation and disarmament measures, build confidence among States and ensure that agreements are being observed by all parties.

"(4) Adequate and effective verification requires employment of different techniques, such as national technical means, international technical means and international procedures, including on-site inspections.

"(5) Verification in the arms limitation and disarmament process will benefit from greater openness.

"(6) Arms limitation and disarmament agreements should include explicit provisions whereby each party undertakes not to interfere with the agreed methods, procedures and techniques of verification, when these are operating in a manner consistent with the provisions of the agreement and generally recognized principles of international law.

"(7) Arms limitation and disarmament agreements should include explicit provisions whereby each party undertakes not to use deliberate concealment measures which impede verification of compliance with the agreement.

"(8) To assess the continuing adequacy and effectiveness of the verification system, an arms limitation and disarmament agreement should provide for procedures and mechanisms for review and evaluation. Where possible, time frames for such reviews should be agreed in order to facilitate this assessment.

"(9) Verification arrangements should be addressed at the outset and at every stage of negotiations on specific arms limitation and disarmament agreements.

"(10) All States have equal rights to participate in the process of international verification of agreements to which they are parties.

"(11) Adequate and effective verification arrangements must be capable of providing, in a timely fashion, clear and convincing evidence of compliance or non-compliance. Continued confirmation of compliance is an essential ingredient to building and maintaining confidence among the parties.

"(12) Determinations about the adequacy, effectiveness and acceptability of specific methods and arrangements intended to verify compliance with the provisions of an arms limitation and disarmament agreement can only be made within the context of that agreement.

"(13) Verification of compliance with the obligations imposed by an arms limitation and disarmament agreement is an activity conducted by the parties to an arms limitation and disarmament agreement or by an organization at the request and with the explicit consent of the parties, and is an expression of the sovereign right of States to enter into such arrangements.

"(14) Requests for inspections or information in accordance with the provisions of an arms limitation and disarmament agreement, should be considered as a normal component of the verification process. Such requests should be used only for the purposes of the determination of compliance, care being taken to avoid abuses.

"(15) Verification arrangements should be implemented without discrimination, and, in accomplishing their purpose, avoid unduly interfering with the internal affairs of States parties or other States, or jeopardizing their economic, technological and social development.

"(16) To be adequate and effective, a verification regime for an agreement must cover all relevant weapons, facilities, locations, installations and activities."

128/ The Secretary-General might encourage Member States with experience in the area of verifying the destruction of weapons to develop programmes to assist other Member States in their verification responsibilities. This might be done by organizing visits to destruction facilities, by demonstrations of systems for weapons detection and by demonstrating protective equipment and procedures for weapons inspectors.

129/ The Group of Governmental Experts (1991) recommended, *inter alia*, that: "(iv) The register should be so designed and maintained as to build confidence, promote restraint in arms transfers on a unilateral, bilateral or multilateral basis to enhance security ..."; see *Study on Ways and Means of Promoting Transparency in International Transfers of Conventional Weapons* (United Nations publication, Sales No. E.93.IX.6, p. 36). The Group also concluded that a consultative mechanism would be useful but that a recommendation on this was beyond its mandate. The subsequent experts panels (1992 and 1994) could not agree on a recommendation on this issue. See A/47/342 and Corr.1, annex, and A/49/316.

130/ See *Official Records of the General Assembly, Fifteenth Special Session, Supplement No. 3* (A/S-15/3), para. 41, and A/48/42, annex II.

131/ The Biological Weapons Convention VEREX report, for example, concluded that some verification measures in combination could provide enhanced monitoring capabilities by increasing the focus and improving the quality of information obtained, thereby improving the possibility of differentiating between prohibited and permitted activities and of resolving ambiguities about compliance. The United Nations could explore more fully the synergies associated with global agreements.

132/ This description of cooperative monitoring is based on the submission on cooperative monitoring by Arian L. Pregenzer, Study Group document SVG/CRP.28.

133/ Note that the information gathered and shared is only in relation to the parties to the agreement.

134/ Note, however, that if the proposal for an imagery analysis centre (see paras. 308-309) is acted upon, it could assume the function of maintaining such baseline data.

135/ The term aircraft as used in the present report includes fixed-wing airplanes, helicopters, airships, balloons and unmanned aerial vehicles which can be used as platforms to carry one or more sensors such as optical, infrared, synthetic aperture radar and remote optical spectroscopy. Gliders and ultra-light aerial vehicles can also be used to carry sensors. Aircraft utilized for surveillance can carry out not only photo reconnaissance, but also radar surveillance, electro-optical signal analysis and electronic information gathering. Among other tasks, aircraft can help monitor international agreements and track troop and equipment movements.

136/ Global Positioning System (GPS) equipment, which is dependent on satellites, has proven invaluable for many United Nations verification activities, including UNSCOM and some peace-keeping operations that require the accurate or rapid determination of locations.

137/ For example, the Security Council, the Secretary-General and IAEA.

138/ For example, OPCW.

139/ Such a centre could provide the basis for a United Nations capability for acquiring, integrating and analysing information from a variety of sources to assist Member States in verifying compliance with multilateral and regional agreements. This capability to integrate or fuse data from many sources could allow the United Nations to provide a channel for exchange of relevant information among the parties to current and future agreements aimed at controlling arms and among those bodies that are charged with implementing those agreements. See Patricia Bliss McFate, Sidney N. Graybeal, George Lindsey and D. Marc Kilgour, "Constraining proliferation: the contribution of verification synergies", Arms Control Verification Studies, No. 5 (Ottawa: Department of External Affairs, March 1993), p. 40.

140/ France, "Working paper: Space in the service of verification. Proposal concerning a satellite imagery processing agency", CD/945.

141/ See, for example, a Swedish proposal made in an address to the Conference on Disarmament on 1 September 1994.

142/ During his briefing to the group, Bruno Pellaud, Deputy Director General of Safeguards, indicated that IAEA was seriously considering the development of a capability to collect, filter and analyse open-source information as part of its efforts to strengthen safeguards.

143/ In order to reduce repetition, this approach was preferred to that of organizing the recommendations under the headings of United Nations activities in disarmament, confidence-building and conflict management.

144/ The submission by Arian Pregenzer provides excellent examples of the sort of commercially available technology that can form the basis for productive sharing. In addition, there are novel technologies not commercially available which Member States may be willing to share. See: document of the Study Group, SVG/CRP.28.

145/ For further information see Unmanned Aerial Vehicles and Targets (Coulsdon, Surrey, United Kingdom, Jane's Information Group, 1995).

ANNEX I

Current applied verification experience a/

Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
1. Peace operations under the Charter of the United Nations	(a) Confirm cease-fires/ cessation of hostilities, troop withdrawals and redeployments	UNTSO UNMOGIP UNDOF UNFICYP UNIKOM UNAVEM III MINURSO UNPROFOR UNAMIR UNOMIG UNMOT UNIFIL	1948-present 1949-present 1974-present 1964-present 1991-present 1995-present 1991-present 1992-present 1993-present 1993-present 1994-present 1978-present	(a) Observation posts (b) Foot patrols (c) Maritime patrols (d) Aerial surveillance (e) Liaison officers
	(b) Confirm demilitarized zones; areas of limitation, no-fly zones, protected and safe areas	UNDOF UNFICYP UNIKOM UNPROFOR UNOMIG UNAMIR UNOMIL	1974-present 1964-present 1991-present 1992-present 1993-present 1993-present 1993-present	(a) Observation posts (b) Foot patrols (c) Vehicle patrols (d) Maritime patrols (e) Aerial surveillance (f) Liaison officers (g) Satellite surveillance (h) Peace-keeping forces (including "preventive deployment")
	(c) Confirm relocation, cantonment, disarming and demobilization of forces in intra-State conflict	MINURSO UNAMIR UNOMIL UNAVEM III	1991-present 1993-present 1993-present 1995-present	(a) Observation posts (b) Foot patrols (c) Vehicle (d) Maritime patrols (e) Aerial surveillance (f) Liaison officers (g) Escorts (h) Destruction of arms (i) Peace-keeping forces

Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
	(d) Validate sanctions	UNPROFOR UNAVEM III UNAMIR	1992-present 1995-present 1993-present	(a) Observation posts (b) Check points (c) Foot patrols (d) Vehicle patrols (e) Maritime patrols (f) Aerial surveillance (g) Satellite surveillance (h) Liaison officers
	(e) Validate the conduct of free and fair elections and referendums	UNAVEM III MINURSO	1995-present 1991-present	(a) Observation (b) Presence (c) Security
	(f) Monitor functioning of the local police/record major violations of human rights	UNAVEM III UNPROFOR UNMIH UNAMIR	1995-present 1992-present 1993-present 1993-present	(a) Patrolling (b) Investigations (c) Inspections
	(g) Monitor provision of humanitarian relief	UNOSOM UNMIH UNAMIR UNPROFOR	1992-1994 1993-present 1993-present 1992-present	(a) Patrolling (b) Escorts (c) Liaison officers (d) Investigations (e) Inspections (f) Peace-keeping forces
Security Council resolution 687 (1991)	(h) Confirm elimination of Iraqi weapons of mass destruction and certain ballistic missiles. Confirm prevention of acquisition and production of same.	(a) UNSCOM (b) IAEA	3 April 1991-present	(a) On-site inspection (b) Sample analysis (c) Satellite surveillance (d) Aerial surveillance (e) Environmental monitoring (f) *In situ* cameras, seals and sensors (g) Collateral analysis (h) Data exchanges

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Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
2. Nuclear Non-Proliferation Treaty	(a) Transfers (b) Peaceful uses (c) Production	International Atomic Energy Agency (IAEA)	1970-present (signed 1 July 1968)	IAEA safeguards: (a) On-site inspection - Ad hoc - Routine - Special (b) Sample analysis (c) Records auditing (d) *In situ* cameras, seals and sensors (e) Data exchanges (f) Collateral analyses
3. Partial test-ban treaty	(a) Testing (b) Environmental	Each party	1963-present	National Means d/
4. 1925 Geneva Protocol (chemical weapons) (a) South-East Asia (b) Iran (Islamic Republic of) (c) Azerbaijan (d) Mozambique (e) Bosnia	(a) Use	Secretary-General	1980-present 1980 1984-1989 1992 1992 1994	(a) ad hoc on-site inspections (b) Chemical analysis (c) National means
5. Chemical Weapons Convention	(a) Destruction (b) Production (c) Testing/research and development (d) Transfers (e) Use (f) Peaceful uses	Organization for the Prohibition of Chemical Weapons (OPCW)	Not yet in force (signed 13 January 1993)	(a) On-site inspections - Regular - Challenge (b) Sample analysis (c) Records auditing (d) Data exchanges (e) National means
6. Biological Weapons Convention	(a) Destruction (b) Production (c) Transfers	Each party (United Nations Centre for Disarmament Affairs)	1975-present (signed 10 April 1972)	National means
7. ENMOD Convention	(a) Use	(Consultative Committee of Experts)	1978-present (signed 18 May 1977)	National means
8. Inhumane Weapons Convention	(a) Use	Secretary-General of the United Nations	1983-present (signed 10 April 1981)	Fact-finding

Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
9. Outer Space Treaty	(a) Peaceful use (b) Deployment	Each party	1967-present (signed 27 January 1967)	(a) On-site inspection (certain provisions) (b) National means
10. Seabed Treaty	(a) Deployment	Each party (with assistance of United Nations)	1972-present (signed 11 February 1971)	(a) On-site inspection (b) National means
11. Treaty of Tlateloco	(a) Peaceful uses (b) Transfers (c) Production (d) Deployment	OPANAL IAEA	1967-present (signed 14 February 1967)	(a) On-site inspections (b) Data exchanges (c) IAEA safeguards
12. Treaty of Rarotonga	(a) Peaceful uses (b) Transfers (c) Production (d) Deployment	IAEA	1986-present (signed 6 August 1985)	(a) IAEA safeguards
13. Antarctic Treaty	(a) Peaceful uses (b) Deployment	Each party	1961-present (signed 1 December 1959)	(a) On-site inspection (b) National means
14. CFE Treaty; Concluding Act of the Negotiations on Personnel Strength of Conventional Armed Forces in Europe (CFEIA)	(a) Destruction (b) Deployment (c) Force levels (d) Removal	Each party (NATO/ Verification Coordination Committee) (Joint Consultative Group)	1992-present (CFE Treaty signed 19 November 1990; CFE 1A Agreement signed 29 June 1992)	(a) On-site inspections - Ad hoc - Challenge (b) National Technical Means (c) Aerial inspections (d) Data exchanges
15. OSCE Vienna Document 1990/1992/1994 (Stockholm Document/1986)	(a) Data (b) Training (c) Confidence-building	Each party (OSCE Conflict Prevention Centre)	1986-present (Vienna document) signed 4 March 1992; Stockholm document signed 19 September 1986)	(a) Data exchanges (b) On-site inspections (c) National technical means (d) Confidence-building measures
16. Open Skies Treaty	(a) Confidence-building	Each party (Open Skies Consultative Commission)	Not yet in force (signed 25 March 1992)	Aerial overflights

Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
17. Mendoza Agreement (chemical weapons)	(a) Transfers	Each party	1991-present (signed 5 September 1991)	On-site inspections
18. Joint US/UK/ Russian Statement on Biological Weapons	(a) Destruction (b) Production (c) Environmental	Each party	1992-present (signed 14 September 1992)	(a) On-site inspections (b) National means
19. Anti-Ballistic Missile Treaty	(a) Deployment (b) Force levels (c) Testing (d) Transfers	Each party (Standing Consultative Commission)	1972-present (signed 26 May 1972)	National technical means
20. Threshold Test-Ban Treaty	(a) Testing	Each party (Bilateral Consultative Commission)	1990-present (signed 3 July 1974)	(a) National technical means (b) Information exchanges (c) On-site inspections (d) *In situ* sensors - Seismic
21. Peaceful Nuclear Explosions Treaty	(As under Threshold Test-Ban Treaty)	Each party (Joint Consultative Commission)	1990-present (signed 28 May 1976)	(As under Threshold Test-Ban Treaty)
22. INF Treaty	(a) Destruction (b) Deployment (c) Production (d) Testing/research and development	Each party (Special Verification Commission)	1988-present (signed 8 December 1987)	(a) National technical means (b) Data exchanges (c) On-site inspections
23. START I and START II	(a) Destruction (b) Force levels (c) Testing (research and development) (d) Transfers	Each party (Joint Compliance and Inspection Commission)	1994- (START I signed 30 July 1991; START II signed 3 January 1993 not yet in force)	(a) National technical means (b) Data exchanges (c) On-site inspections

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Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
24. Agreement between the United States of America and USSR on Destruction and Non-Production of Chemical Weapons and on Measures to Facilitate the Multilateral Convention on Banning Chemicals	(a) Destruction (b) Production (c) Environmental	Each party	Not yet in force (signed 1 June 1990)	(a) On-site inspections (b) National means
25. Memorandum of Understanding between the Government of the United States of America and the Government of the USSR regarding a Bilateral Verification Experiment and Data Exchange Related to Prohibition of Chemical Weapons	(a) Quantities (b) Destruction (c) Production	Each party	1990-1991 (signed 23 September 1989) (completed)	(a) National means (b) On-site inspections (c) Data exchanges
26. Understanding Between the Government of the United States of America and the Government of the Russian Federation on Measures for the Preparation and Implementation of the Second Phase of the Wyoming Memorandum of Understanding	(a) Quantities (b) Production (c) Testing/research and development (d) Destruction	Each party	1994 (signed 14 January 1994) (completed)	(a) Data exchanges (b) On-site inspections (c) National means

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Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
27. Agreement Between Argentina and Brazil for the Exclusively Peaceful Use of Nuclear Energy	(a) Peaceful uses (b) Transfers (c) Production	Argentinian-Brazilian Agency for Accounting and Control of Nuclear Materials (ABACC)	1991-present (signed 17 July 1991)	(a) On-site inspections (b) IAEA safeguards
28. Various bilateral nuclear trade agreements	(a) Production (b) Peaceful uses (c) Transfers	IAEA	1957-present	IAEA safeguards
29. Joint Declaration of the Denuclearization of the Korean Peninsula	(a) Transfers (b) Production (c) Testing/Research and Development (d) Peaceful uses	Each party (South/North Joint Nuclear Control Commission)	February 1992 (signed 20 January 1992)	On-site inspections
30. Agreement on Reconciliation, Non-Aggression and Cooperation and Exchange Between North and South (Korea)	(a) Force levels (b) Deployment (c) Confidence-building	Each party (South/North Joint Military Commission, established 7 May 1992)	February 1992 (signed 15 December 1991)	(a) Data exchanges (b) On side inspections
31. India/Pakistan Non-Attack on Nuclear Facility Agreement	(a) Confidence-building	Each party	1991-present (signed December 1988)	National means
32. India/Pakistan Agreement on Chemical Weapons	(a) Production (b) Deployment (c) Use (d) Confidence-building	Each party	1992-present (signed 19 August 1992)	National means
33. Egypt-Israel peace treaty	(a) Deployment (b) Removal	"Third-party" (multinational forces and observers (MFO))	1979-present (signed 26 March 1979)	(a) On-site inspections (MFO) (b) Control posts (c) Aerial inspections (MFO) (d) National technical means

Source of obligation b/	Verification objective	Verification organization/ body c/	Year	Verification methods
34. Agreement between Hungary and Romania on the Establishment of an Open Skies Regime	(a) Confidence-building	Each party	1991-present (signed 11 May 1991)	Aerial overflights
35. Joint Statement on Inspection of Facilities containing Fissile Materials Removed from Nuclear Weapons (Russian Federation and United States)	(a) Destruction (b) Quantities	Each party; IAEA	1994-present	(a) On-site inspections (b) Data exchanges (c) National Technical Means
36. Joint Statement on Transparency and Irreversibility of the Process of Reducing Nuclear Weapons (Russian Federation and United States)	(a) Quantities (b) Destruction	Each party	1995-present	(a) Data exchanges (b) On-site inspection

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Notes

a/ The information presented herein is for illustrative rather than interpretative purposes. It does not represent a judgement or endorsement by the Group of Experts. Readers are advised to refer to the original documents for additional detail. The information is not intended to be exhaustive, but reflects those verification obligations judged most pertinent to the work of the Group of Experts.

b/ The information is presented primarily according to the nature of the regime, moving from the global sphere to the regional, to the bilateral one.

c/ Also included in this column are organizations/forums where the parties to agreements discuss verification and compliance questions.

d/ "National means" is used generally when the verification methods are not specified. When a treaty/agreement explicitly mentions "national technical means" or other methods, these are specified in the table. In general, it is to be expected that States parties will use their national technical means and their national intelligence means in addition to those methods specified in the treaty/agreement.

ANNEX II

Selected examples of cooperative verification technologies

1. Database management systems that store and retrieve extensive and detailed information have already become a major verification tool. Research associated with the development of a compatible system covering the data associated with START I and II will be useful in areas in which international agreements require the collection, analysis, storage and retrieval of vast amounts of data. Research has also led to the development, testing and demonstration of a comprehensive data-management system to meet the information collection, storage and retrieval requirements for the Technical Secretariat of OPCW. The Chemical Weapons Convention calls for a large and complex array of data on such subjects as scheduled chemicals, military and industrial production and storage sites, analytical and toxicological data, scheduled chemicals production quantities, as well as administrative data. UNSCOM has developed automated data fusion software to assist in planning its inspections and its long-term compliance-monitoring activities pursuant to Security Council resolution 687 (1991).

2. Software tools are needed to access databases containing the information exchanges and updates required by the CFE Treaty, the agreements on confidence- and security-building measures and the Open Skies Treaty. NATO's Verification and Implementation Coordination Staff (VICS) has developed VERITY, a database for managing data exchanges, notifications and inspection reports regarding the CFE Treaty. Each regime generates large amounts of information which must be analysed and archived. While the data are valuable when analysed solely within a specific regime, additional insights can be gained through analyses of the full range of data associated with the three agreements.

3. Advanced sensors, information-processing systems and communication systems, designed and developed through arms control research and from other sources, have potential applications in many areas of peace-keeping and disarmament/arms limitation. Sensor monitoring was employed in the Sinai to monitor troop withdrawal (1976-1982). Some types of short- and intermediate-range sensors are installed for portal and perimeter monitoring under the INF and START treaties. Many sensor types exist which can be used to detect land vehicles or aircraft. They have ranges from dozens of metres to several kilometres. Some can also detect persons at close range. The types include: pressure sensors, ultrasound sensors, weighbridges, induction loops, magnetic sensors, passive infrared sensors, arrays of light-beam interruption devices, microphones, seismic sensors, photo and video cameras and radar. They can be used, often in combination, to monitor: (a) points (portals of installations, declared exit/entry points, road controls); (b) lines (perimeters of installations with or without fences or walls, designated lines - without physical barrier - through cross country); or (c) areas (airbases or larger areas). Some sensor types function in a passive mode and some function independently of lighting or weather conditions.

4. These verification technologies are especially useful for continuous, permanent monitoring tasks. They might increase the efficiency of personnel, possibly reducing the requirement for supporting manpower. In disarmament, they

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might make possible new, farther-reaching quantitative or qualitative limits on arms and armed forces. In peace-keeping operations, they might allow more comprehensive monitoring of zones and zone boundaries. They might lower the risk of casualties from friendly fire and achieve substantial reductions in financial costs.

5. Requirements of the Chemical Weapons Convention have led to the development of a number of new verification tools, including hand-held detectors and highly portable analytical instrumentation, required for conducting on-site inspections and on-site analysis of samples collected during the inspections. The sample collection, handling and analysis and the methodologies required to implement the various Chemical Weapons Convention verification regimes must meet stringent standards for quality assurance and accountability to ensure that analytical results are credible and replicable within the international laboratory system, certified by the Convention. These sampling and analysis methodologies are being developed to meet these standards.

6. The hand-held microchip gas chromatograph is an example of an effort to miniaturize the detection equipment needed by the inspectors under the Chemical Weapons Convention to transport, while still allowing for analysis of samples during the conduct of inspections. The generic detector, a tool of the Convention designed continuously and automatically to detect volatile Schedule 1 and 2 chemicals below human response levels, is in the developmental stage; it should be portable enough to deploy on all types of inspections. Two acoustic techniques, ultrasonic pulse-echo and acoustic resonance spectroscopy, have also been developed; the former can measure the fill level in bulk storage containers, and the latter can identify liquid-filled munitions and categorize munitions of a similar fill type.

7. Chemical-weapons "signatures" analysis research has been established to identify and examine the characteristics (signatures) exhibited by activities which are prohibited or limited under the Chemical Weapons Convention. Knowledge of these signatures will support the development, testing and evaluation of systems to detect or recognize such activities. The results of this research effort are expected to provide the Preparatory Committee with time frames within which challenge inspections must be accomplished in order to have technically justifiable results.

8. Advanced research in verification technologies includes efforts to develop tags and seals. A tamper-resistant tag is irremovably connected to a piece of treaty-limited equipment (such as a tank, aircraft or ballistic missile). It functions as a unique identifier; it proves the legality of the item under a treaty and alleviates counting (each item found without a valid tag is immediately recognized as a violation). A seal ensures that two objects remain linked together or that a hatch or door remains closed. "Remotely-interrogated" seals can be used in a system to track and monitor on a global scale sensitive items such as nuclear weapons components or weapon-delivery systems. Additional emerging technologies include "smart video" equipment and, with potential future use in the implementation of the verification of the Chemical Weapons Convention, or a possible verification regime for the Biological Weapons Convention, acoustic interferometry spectroscopy and large-volume air sampling.

ANNEX III

List of written submissions and presentations

1.	SVG/CRP.1	Contribution by the International Atomic Energy Agency.
2.	SVG/CRP.2	Contribution by Mr. Michael Krepon, President, The Henry L. Stimson Center, Washington, D.C.
3.	SVG/CRP.3	Contribution by the Stockholm International Peace Research Institute (SIPRI).
4.	SVG/CRP.4	Contribution by the United Nations Institute for Disarmament Research (UNIDIR).
5.	SVG/CRP.5	"Developing verification arrangements: lessons from European experience", contribution by Mr. Peter von Butler, on behalf of German experts.
6.	SVG/CRP.6	Contribution by Verification Technology Information Centre (VERTIC), London.
7.	SVG/CRP.7	"The Chemical Weapons Convention: preparations for entry into force", contribution by Mr. Ian Kenyon, Executive Secretary, Preparatory Commission for the Organization for the Prohibition of Chemical Weapons, Provisional Technical Secretariat.
8.	SVG/CRP.8	"The Conference on Disarmament's Group of Scientific Experts: overview", contribution by Dr. Ola Dahlman, summarized by Dr. Frode Ringdal, Scientific Secretary of the Group of Scientific Experts.
9.	SVG/CRP.12	Summary of points made at presentation by UNSCOM Executive Chairman, Ambassador Rolf Ekeus.
10.	SVG/CRP.13	Summary of points made by Mr. Bruno Pellaud, Deputy Director General of Safeguards, IAEA.
11.	SVG/CRP.14	"NATO's role in verification and compliance monitoring for the CFE Treaty and the Vienna Document", presentation by Mr. Nedimoglu, Head, VICS, NATO.
12.	SVG/CRP.16	CSCE contribution to the United Nations study on verification in all its aspects.
13.	SVG/CRP.18	Summary of points made by Ambassador Tibor Toth on VEREX experience.
14.	SVG/CRP.19	Summary of points made by Mr. Necil Nedimoglu, Head, VICS, NATO.

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15.	SVG/CRP.21	Further contribution of the OSCE Conflict Prevention Centre, Ambassador Jan Kubis, Director.
16.	SVG/CRP.23	Further contribution by Mr. Ian R. Kenyon, Executive Secretary, Preparatory Commission for the Organization for the Prohibition of Chemical Weapons, Provisional Technical Secretariat.
17.	SVG/CRP.28	Submission by Mr. Arian L. Pregenzer, "Enhancing regional security agreements through cooperative monitoring", Sandia National Laboratories, Albuquerque, New Mexico; Sandia report, SAND94-3250, May 1995.

In addition to the foregoing, the Group received oral presentations from:

- Mr. Ron Cleminson, Senior Verification Adviser, Department of Foreign and International Trade, Ottawa, Canada.
- Mr. Joachim Hutter, Director, Department of Peace-keeping Operations, United Nations.
